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R000001
R000002 ********************************************************************************************************
R000004 *                                                                                                      *
R000006 *              THIS AGC PROGRAM SHALL ALSO BE REFERRED TO AS'                                          *
R000008 *                                                                                                      *
R00001  *              COLOSSUS 1A                                                                             *
R000012 *                                                                                                      *
R000014 *              PREPARED BY'                                                                            *
R000016 *              MASSACHUSETTS INSTITUTE OF TECHNOLOGY                                                   *
R000018 *              75 CAMBRIDGE PARKWAY                                                                    *
R00002  *              CAMBRIDGE, MASSACHUSETTS                                                                *
R000022 *              UNDER NASA CONTRACT NAS 9-4065.                                                         *
R000024 *                                                                                                      *
R000026 ********************************************************************************************************
R0001   ASSEMBLY AND OPERATIONS INFORMATION
R0002   TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS
R0003   SUBROUTINE CALLS
R0004           KILERASE
R0005                   ERASABLE ASSIGNMENTS
R0006           KOOLADE
R0007                   INTERRUPT LEAD INS
R0008                   T4RUPT PROGRAM
R0009                   DOWNLINK LISTS
R0010                   FRESH START AND RESTART
R0011                   RESTART TABLES
R0012                   SXTMARK
R0013                   EXTENDED VERBS
R0014                   PINBALL NOUN TABLES
R0015                   CSM GEOMETRY
R0016                   IMU COMPENSATION PACKAGE
R0017                   PINBALL GAME  BUTTONS AND LIGHTS
R0018                   R60,R62
R0019                   ANGLFIND
R0020                   GIMBAL LOCK AVOIDANCE
R0021                   KALCMANU STEERING
R0022                   SYSTEM TEST STANDARD LEAD INS
R0023                   IMU CALIBRATION AND ALIGNMENT
R0024           SMOOCH
R0025                   GROUND TRACKING DETERMINATION PROGRAM - P21
R0026                   P34-P35, P74-P75
R0027                   R31
R0028                   P76
R00285                  R30
R0029                   STABLE ORBIT - P38-P39
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R0030           PANDORA
R0031                   P11
R0032                   TPI SEARCH
R0033                   P20-P25
R0034                   P30,P37
R0035                   P40-P47
R0036                   P51-P53
R0037                   LUNAR AND SOLAR EPHEMERIDES SUBROUTINES
R0038                   P61-P67
R0039                   SERVICER207
R0040                   ENTRY LEXICON
R0041                   REENTRY CONTROL
R0042                   CM BODY ATTITUDE
R0043                   P37,P70
R0044                   S-BAND ANTENNA FOR CM
R0045                   LUNAR LANDMARK SELECTION FOR CM
R0046           DAPCSM
R0047                   TVCINITIALIZE
R0048                   TVCEXECUTIVE
R0049                   TVCMASSPROP
R0050                   TVCRESTARTS
R0051                   TVCDAPS
R0052                   TVCSTROKETEST
R0053                   TVCROLLDAP
R0054                   TVCGEN3FILTERS
R0055                   MYSUBS
R0056                   RCS-CSM DIGITAL AUTOPILOT
R0057                   AUTOMATIC MANEUVERS
R0058                   RCS-CSM DAP EXECUTIVE PROGRAMS
R0059                   JET SELECTION LOGIC
R0060                   CM ENTRY DIGITAL AUTOPILOT
R0061           SATRAP
R0062                   DOWN-TELEMETRY PROGRAM
R0063                   INTER-BANK COMMUNICATION
R0064                   INTERPRETER
R0065                   FIXED-FIXED CONSTANT POOL
R0066                   INTERPRETIVE CONSTANTS
R0067                   SINGLE PRECISION SUBROUTINES
R0068                   EXECUTIVE
R0069                   WAITLIST
R0070                   LATITUDE LONGITUDE SUBROUTINES
R0071                   PLANETARY INERTIAL ORIENTATION
R0072                   MEASUREMENT INCORPORATION
R0073                   CONIC SUBROUTINES
R0074                   INTEGRATION INITIALIZATION
R0075                   ORBITAL INTEGRATION
R0076                   INFLIGHT ALIGNMENT ROUTINES
R0077                   POWERED FLIGHT SUBROUTINES
R0078                   TIME OF FREE FALL
R0079                   STAR TABLES
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R0080 AGC BLOCK TWO SELF-CHECK
R0081 PHASE TABLE MAINTENANCE
R0082 RESTARTS ROUTINE
R0083 IMU MODE SWITCHING ROUTINES
R0084 KEYRUPT, UPRUPT
R0085 DISPLAY INTERFACE ROUTINES
R0086 SERVICE ROUTINES
R0087 ALARM AND ABORT
R0088 UPDATE PROGRAM
R0089 RTB OP CODES
R0090 SYMBOL TABLE LISTING
R0091 UNREFERENCED SYMBOL LISTING
R0092 ERASABLE d EQUALS CROSS-REFERENCE TABLE
R0093 SUMMARY OF SYMBOL TABLE LISTINGS
R0094 MEMORY TYPE d AVAILABLITY DISPLAY
R0095 COUNT TABLE
R0096 PARAGRAPHS GENERATED FOR THIS ASSEMBLY
R0097 OCTAL LISTING
R0098 OCCUPIED LOCATIONS TABLE
R0099 SUBROS CALLED d PROGRAM STATUS

P0100 VERB LIST FOR CSM

R0101 REGULAR VERBS

R0102 00 NOT IN USE
R0103 01 DISPLAY OCTAL COMP 1 IN R1
R0104 02 DISPLAY OCTAL COMP 2 IN R1
R0105 03 DISPLAY OCTAL COMP 3 IN R1
R0106 04 DISPLAY OCTAL COMP 1,2 IN R1,R2
R0107 05 DISPLAY OCTAL COMP 1,2,3 IN R1,R2,R3
R0108 06 DISPLAY DECIMAL IN R1 OR R1,R2 OR R1,R2,R3
R0109 07 DISPLAY DP DECIMAL IN R1,R2 (TEST ONLY)
R0110 08
R0111 09
R0112 10
R0113 11 MONITOR OCTAL COMP 1 IN R1
R0114 12 MONITOR OCTAL COMP 2 IN R1
R0115 13 MONITOR OCTAL COMP 3 IN R1
R0116 14 MONITOR OCTAL COMP 1,2 IN R1,R2
R0117 15 MONITOR OCTAL COMP 1,2,3 IN R1,R2,R3
R0118 16 MONITOR DECIMAL IN R1 OR R1,R2 OR R1,R2,R3
R0119 17 MONITOR DP DECIMAL IN R1,R2 (TEST ONLY)
R0120 18
R0121 19
R0122 20
R0123 21 LOAD COMPONENT 1 INTO R1
R0124 22 LOAD COMPONENT 2 INTO R2
R0125 23 LOAD COMPONENT 3 INTO R3
R0126 24 LOAD COMPONENT 1,2 INTO R1,R2
R0127 25 LOAD COMPONENT 1,2,3 INTO R1,R2,R3
R0128 26
R0129 27 DISPLAY FIXED MEMORY
R0130 28
R0131 29
R0132 30 REQUEST EXECUTIVE
R0133 31 REQUEST WAITLIST
R0134 32 RECYCLE PROGRAM
R0135 33 PROCEED WITHOUT DSKY INPUTS
R0136 34 TERMINATE FUNCTION
R0137 35 TEST LIGHTS
R0138 36 REQUEST FRESH START
R0139 37 CHANGE PROGRAM (MAJOR MODE)
R0140 38
R0141 39

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P0142 EXTENDED VERBS

R0143 40 ZERO CDU-S
R0144 41 COARSE ALIGN CDU-S
R0145 42 FINE ALIGN IMU-S
R0146 43 LOAD IMU ATT ERROR METERS
R0147 44 SET SURFACE FLAG
R0148 45 RESET SURFACE FLAG
R0149 46 ESTABLISH G+C CONTROL
R0150 47 MOVE LM STATE VECTOR INTO CM STATE VECTOR.
R0151 48 REQUEST DAP DATA LOAD ROUTINE (R03)
R0152 49 REQUEST CREW DEFINED MANEUVER ROUTINE (R62)
R0153 50 PLEASE PERFORM
R0154 51 PLEASE MARK
R0155 52 MARK ON OFFSET LANDING SITE
R0156 53 PLEASE PERFORM ALTERNATE LOS MARK
R0157 54 REQUEST RENDEZVOUS BACKUP SIGHTING MARK ROUTINE (R23)
R0158 55 INCREMENT AGC TIME (DECIMAL)
R0159 56 TERMINATE TRACKING (P20 + P25)
R0160 57 REQUEST RENDEZVOUS SIGHTING MARK ROUTINE (R21)
R0161 58 RESET STICK FLAG
R0162 59 PLEASE CALIBRATE
R0163 60 SET ASTRONAUT TOTAL ATTITUDE (N17) TO PRESENT ATTITUDE
R0164 61 DISPLAY DAP ATTITUDE ERROR
R0165 62 DISPLAY TOTAL ATTITUDE ERROR (WRT N22 (THETAD))
R0166 63 DISPLAY TOTAL ASTRONAUT ATTITUDE ERROR (WRT N17 (CPHIX))
R0167 64 REQUEST S-BAND ANTENNA ROUTINE
R0168 65 OPTICAL VERIFICATION OF PRELAUNCH ALIGNMENT
R0169 66 VEHICLES ARE ATTACHED. MOVE THIS VEHICLE STATE TO OTHER VEHICLE.
R0170 67
R0171 68 CSM STROKE TEST ON
R0172 69 CAUSE RESTART
R0173 70 UPDATE LIFTOFF TIME
R0174 71 UNIVERSAL UPDATE-BLOCK ADR
R0175 72 UNIVERSAL UPDATE-SINGLE ADR
R0176 73 UPDATE AGC TIME (OCTAL)
R0177 74 INITIALIZE ERASABLE DUMP VIA DOWNLINK
R0178 75 BACKUP LIFTOFF
R0179 76 SET PREFERRED ATTITUDE FLAG
R0180 77 RESET PREFERRED ATTITUDE FLAG
R0181 78 UPDATE PRELAUNCH AZIMUTH
R0182 79 REQUEST LUNAR LANDMARK SELECTION ROUTINE (R35)
R0183 80 UPDATE LEM STATE VECTOR
R0184 81 UPDATE CSM STATE VECTOR
R0185 82 REQUEST ORBIT PARAM DISPLAY (R30)
R0186 83 REQUEST REND PARAM DISPLAY (R31)
R0187 84 START TARGET DELTA V (R32)
R0188 85 REQUEST RENDEZVOUS PARAMETER DISPLAY NO. 2 (R34)
R0189 86 REJECT RENDEZVOUS BACKUP SIGHTING MARK
R0190 87 SET VHF RANGE FLAG

R0191 88 RESET VHF RANGE FLAG
R0192 89 REQUEST RENDEZVOUS FINAL ATTITUDE ROUTINE (R63)
R0193 90 REQUEST RENDEZVOUS OUT OF PLANE DISPLAY ROUTINE (R36)
R0194 91 DISPLAY BANK SUM
R0195 92 OPERATE IMU PERFORMANCE TEST (P07)
R0196 93 ENABLE W MATRIX INITIALIZATION
R0197 94 PERFORM CYSLUNAR ATTITUDE MANEUVER (P23)
R0198 95 NO UPDATE OF EITHER STATE VECTOR (P20 OR P22)
R0199 96 TERMINATE INTEGRATION AND GO TO P00
R0200 97 PERFORM ENGINE FAIL PROCEDURE
R0201 98 ENABLE TRANSLUNAR INJECT
R0202 99 PLEASE ENABLE ENGINE

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P0203 IN THE FOLLOWING NOUN LIST THE 'NO LOAD' RESTRICTION MEANS THE NOUN
R0204 CONTAINS AT LEAST ONE COMPONENT WHICH CANNOT BE LOADED, I.E. OF
R0205 SCALE TYPE L (MIN/SEC) OR PP (2 INTEGERS).
R0206 IN THIS CASE VERBS 24 AND 25 ARE NOT ALLOWED, BUT VERBS 21, 22 OR 23
R0207 MAY BE USED TO LOAD ANY OF THE NOUN'S COMPONENTS WHICH ARE NOT OF THE
R0208 ABOVE SCALE TYPES.
R0209 THE 'DEC ONLY' RESTRICTION MEANS ONLY DECIMAL OPERATION IS ALLOWED ON
R0210 EVERY COMPONENT IN THE NOUN. (NOTE THAT 'NO LOAD' IMPLIES 'DEC ONLY'.)

	NORMAL NOUNS	COMPONENTS	SCALE AND DECIMAL POINT	RESTRICTIONS
R0211				
R0213	00 NOT IN USE			
R0214	01 SPECIFY MACHINE ADDRESS (FRACTIONAL)	3COMP	.XXXXX FOR EACH	
R0215	02 SPECIFY MACHINE ADDRESS (WHOLE)	3COMP	XXXXX. FOR EACH	
R0216	03 SPECIFY MACHINE ADDRESS (DEGREES)	3COMP	XXX.XX DEG FOR EACH	
R0217	04 SPARE			
R0218	05 ANGULAR ERROR/DIFFERENCE	1COMP	XXX.XX DEG	
R0219	06 OPTION CODE	2COMP	OCTAL ONLY FOR EACH	
R0220	LOADING NOUN 07 WILL SET OR RESET SELECTED BITS IN ANY ERASABLE REGISTER			
R0221	07 ECADR OF WORD TO BE MODIFIED	3COMP	OCTAL ONLY FOR EACH	
R0222	ONES FOR BITS TO BE MODIFIED			
R0223	1 TO SET OR 0 TO RESET SELECTED BITS			
R0224	08 ALARM DATA	3COMP	OCTAL ONLY FOR EACH	
R0225	09 ALARM CODES	3COMP	OCTAL ONLY FOR EACH	
R0226	10 CHANNEL TO BE SPECIFIED	1COMP	OCTAL ONLY	
R0227	11 SPARE			
R0228	12 OPTION CODE	2COMP	OCTAL ONLY FOR EACH	
R0229	(USED BY EXTENDED VERBS ONLY)			
R0230	13 SPARE			
R0231	14 SPARE			
R0232	15 INCREMENT MACHINE ADDRESS	1COMP	OCTAL ONLY	
R0233	16 TIME OF EVENT	3COMP	00XXX. HRS	DEC ONLY
R0235	(USED BY EXTENDED VERBS ONLY)		000XX. MIN	MUST LOAD 3 COMPS
R0237			0XX.XX SEC	
R0238	17 ASTRONAUT TOTAL ATTITUDE	3COMP	XXX.XX DEG FOR EACH	
R0239	18 AUTO MANEUVER GALL ANGLES	3COMP	XXX.XX DEG FOR EACH	
R0240	19 BYPASS ATTITUDE TRIM MANEUVER	3COMP	XXX.XX DEG FOR EACH	
R0241	20 ICDU ANGLES	3COMP	XXX.XX DEG FOR EACH	
R0242	21 PIPAS	3COMP	XXXXX. PULSES FOR EACH	
R0244	22 NEW ICDU ANGLES	3COMP	XXX.XX DEG FOR EACH	
R0245	23 SPARE			
R0246	24 DELTA TIME FOR AGC CLOCK	3COMP	00XXX. HRS	DEC ONLY
R0248			000XX. MIN	MUST LOAD 3 COMPS
R0250			0XX.XX SEC	
R0251	25 CHECKLIST	3COMP	XXXXX. FOR EACH	
R0252	(USED WITH PLEASE PERFORM ONLY)			
R0253	26 PRIORITY/DELAY, ADRES, BBCON	3COMP	OCTAL ONLY FOR EACH	
R0254	27 SELF TEST ON/OFF SWITCH	1COMP	XXXXX.	
R0255	28 SPARE			
R0256	29 XSM LAUNCH AZIMUTH	1COMP	XXX.XX DEG	DEC ONLY

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P0258	30 TARGET CODES	3COMP	XXXXX. FOR EACH	
R0259	31 TIME OF LANDING SITE	3COMP	00XXX. HRS	DEC ONLY
R0281			000XX. MIN	MUST LOAD 3 COMPS
R0283			0XX.XX SEC	
R0284	32 TIME FROM PERIGEE	3COMP	00XXX. HRS	DEC ONLY
R0288			000XX. MIN	MUST LOAD 3 COMPS
R0288			0XX.XX SEC	
R0289	33 TIME OF IGNITION	3COMP	00XXX. HRS	DEC ONLY
R0271			000XX. MIN	MUST LOAD 3 COMPS
R0273			0XX.XX SEC	
R0274	34 TIME OF EVENT	3COMP	00XXX. HRS	DEC ONLY
R0278			000XX. MIN	MUST LOAD 3 COMPS
R0278			0XX.XX SEC	
R0279	35 TIME FROM EVENT	3COMP	00XXX. HRS	DEC ONLY
R0281			000XX. MIN	MUST LOAD 3 COMPS
R0283			0XX.XX SEC	
R0284	36 TIME OF AGC CLOCK	3COMP	00XXX. HRS	DEC ONLY
R0288			000XX. MIN	MUST LOAD 3 COMPS
R0288			0XX.XX SEC	
R0289	37 TIG OF TPI	3COMP	00XXX. HRS	DEC ONLY
R0291			000XX. MIN	MUST LOAD 3 COMPS
R0293			0XX.XX SEC	
R0294	38 TIME OF STATE VECTOR	3COMP	00XXX. HRS	DEC ONLY
R0298			000XX. MIN	MUST LOAD 3 COMPS
R0298			0XX.XX SEC	
R0299	39 DELTA TIME FOR TRANSFER	3COMP	00XXX. HRS	DEC ONLY
R0301			000XX. MIN	MUST LOAD 3 COMPS
R0303			0XX.XX SEC	

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		MIXED NOUNS	COMPONENTS	SCALE AND DECIMAL POINT	RESTRICTIONS
R0304					
R0306	40	TIME FROM IGNITION/CUTOFF	3COMP	XX(B)XX MIN/SEC	NO LOAD, DEC ONLY
R0308		VG,		XXXX.X FT/SEC	
R0309		DELTA V (ACCUMULATED)		XXXX.X FT/SEC	
R0310	41	TARGET AZIMUTH,	2COMP	XXX.XX DEG	
R0311		ELEVATION		XX.XX DEG	
R0312	42	APOGEE,	3COMP	XXXX.X NAUT MI	DEC ONLY
R0314		PERIGEE,		XXXX.X NAUT MI	
R0315		DELTA V (REQUIRED)		XXXX.X FT/SEC	
R0316	43	LATITUDE,	3COMP	XXX.XX DEG	DEC ONLY
R0318		LONGITUDE,		XXX.XX DEG	
R0319		ALTITUDE		XXXX.X NAUT MI	
R0320	44	APOGEE,	3COMP	XXXX.X NAUT MI	NO LOAD, DEC ONLY
R0322		PERIGEE,		XXXX.X NAUT MI	
R0323		TPF		XX(B)XX MIN/SEC	
R0324	45	MARKS (VHF - OPTICS)	3 COMP	+XX(B)XX	NO LOAD, DEC ONLY
R0326		TPI OF NEXT BURN		XX(B)XX MIN/SEC	
R0327		MGA		XXX.XX DEG	
R0328	46	AUTOPILOT CONFIGURATION	2COMP	OCTAL ONLY FOR EACH	
R0329	47	THIS VEHICLE WEIGHT	2COMP	XXXXX. LBS	DEC ONLY
R0331		OTHER VEHICLE WEIGHT		XXXXX. LBS	
R0332	48	PITCH TRIM	2COMP	XXX.XX DEG	DEC ONLY
R0334		YAW TRIM,		XXX.XX DEG	
R0335	49	DELTA R	3COMP	XXXX.X NAUT MI	DEC ONLY
R0337		DELTA V		XXXX.X FT/SEC	
R0338		VHF OR OPTICS CODE		XXXXX.	
R0339	50	SPLASH ERROR,	3COMP	XXXX.X NAUT MI	NO LOAD, DEC ONLY
R0341		PERIGEE,		XXXX.X NAUT MI	
R0342		TPF		XX(B)XX MIN/SEC	
R0343	51	S-BAND ANTENNA ANGLES PITCH	2COMP	XXX.XX DEG	DEC ONLY
R0345		YAW		XXX.XX DEG	
R0346	52	CENTRAL ANGLE OF ACTIVE VEHICLE	1COMP	XXX.XX DEG	
R0347	53	RANGE,	3COMP	XXX.XX NAUT MI	DEC ONLY
R0349		RANGE RATE,		XXXX.X FT/SEC	
R0350		PHI		XXX.XX DEG	
R0351	54	RANGE,	3COMP	XXX.XX NAUT MI	DEC ONLY
R0353		RANGE RATE,		XXXX.X FT/SEC	
R0354		THETA		XXX.XX DEG	
R0355	55	PERIGEE CODE	3COMP	XXXXX.	DEC ONLY
R0357		ELEVATION ANGLE		XXX.XX DEG	
R0358		CENTRAL ANGLE OF PASSIVE VEHICLE		XXX.XX DEG	
R0359	56	REENTRY ANGLE,	2COMP	XXX.XX DEG	DEC ONLY
R0361		DELTA V		XXXXX. FT/SEC	
R0362	57	DELTA R	1COMP	XXXX.X NAUT MI	DEC ONLY
R0364	58	PERIGEE ALT (POST TPI)	3COMP	XXXX.X NAUT MI	DEC ONLY
R0366		DELTA V TPI		XXXX.X FT/SEC	
R0367		DELTA V TPF		XXXX.X FT/SEC	
R0368	59	DELTA VELOCITY LOS	3COMP	XXXX.X FT/SEC FOR EA.	DEC ONLY
R0370	60	GMAX,	3COMP	XXX.XX G	DEC ONLY

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R0372		VPRED,		XXXXX. FT/SEC	
R0373		GAMMA EI		XXX.XX DEG	
R0374	61	IMPACT LATITUDE,	3COMP	XXX.XX DEG	DEC ONLY
R0376		IMPACT LONGITUDE,		XXX.XX DEG	
R0377		HEADS UP/DOWN		+/- 00001	
R0378	62	INERTIAL VEL MAG (VI),	3COMP	XXXXX. FT/SEC	DEC ONLY
R0380		ALT RATE CHANGE (HDOT),		XXXXX. FT/SEC	
R0381		ALT ABOVE PAD RADIUS (H)		XXXX.X NAUT MI	
R0382	63	RANGE 297,431 TO SPLASH (RTGO),	3COMP	XXXX.X NAUT MI	NO LOAD, DEC ONLY
R0384		PREDICTED INERT VEL (VIO),		XXXXX. FT/SEC	
R0385		TIME FROM 297,431 (TFE)		XXBXX MIN/SEC	
R0388	64	DRAG ACCELERATION,	3COMP	XXX.XX G	DEC ONLY
R0388		INERTIAL VELOCITY (VI),		XXXXX. FT/SEC	
R0389		RANGE TO SPLASH		XXXX.X NAUT MI	
R0390	65	SAMPLED AGC TIME	3COMP	00XXX. HRS	DEC ONLY
R0392		(FETCHED IN INTERRUPT)		000XX. MIN	MUST LOAD 3 COMPS
R0394				0XX.XX SEC	
R0395	66	COMMAND BANK ANGLE (BETA),	3COMP	XXX.XX DEG	DEC ONLY
R0397		CROSS RANGE ERROR,		XXXX.X NAUT MI	
R0398		DOWN RANGE ERROR		XXXX.X NAUT MI	
R0399	67	RANGE TO TARGET,	3COMP	XXXX.X NAUT MI	DEC ONLY
R0401		PRESENT LATITUDE,		XXX.XX DEG	
R0402		PRESENT LONGITUDE		XXX.XX DEG	
R0403	68	COMMAND BANK ANGLE (BETA),	3COMP	XXX.XX DEG	DEC ONLY
R0405		INERTIAL VELOCITY (VI),		XXXXX. FT/SEC	
R0406		ALT RATE CHANGE (RDOT)		XXXXX. FT/SEC	
R0407	69	BETA	3COMP	XXX.XX DEG	DEC ONLY
R0409		DL		XXX.XX G	
R0410		VL		XXXXX. FT/SEC	
R0411	70	STAR CODE,	3COMP	OCTAL ONLY	
R0412		LANDMARK DATA,		OCTAL ONLY	
R0413		HORIZON DATA		OCTAL ONLY	
R0414	71	STAR CODE	3COMP	OCTAL ONLY	
R0415		LANDMARK DATA		OCTAL ONLY	
R0416		HORIZON DATA		OCTAL ONLY	
R0417	72	DELT ANG	3COMP	XXX.XX DEG	DEC ONLY
R0419		DELT ALT		XXXX.X NAUT MI	
R0420		SEARCH OPTION		XXXXX.	
R0421	73	SPARE			
R0422	74	SPARE			
R0423	75	SPARE			
R0424	76	SPARE			
R0425	77	SPARE			
R0426	78	SPARE			
R0427	79	SPARE			
R0428	80	TIME FROM IGNITION/CUTOFF	3COMP	XXBXX MIN/SEC	NO LOAD, DEC ONLY
R0430		VG		XXXXX. FT/SEC	
R0431		DELTA V (ACCUMULATED)		XXXXX. FT/SEC	
R0432	81	DELTA V (LV)	3COMP	XXXX.X FT/SEC FOR EACH	DEC ONLY

P0434	82	SPARE			
R0435	83	DELTA V (BODY)	3COMP	XXXX.X FT/SEC FOR EACH	DEC ONLY
R0437	84	DELTA V (OTHER VEHICLE)	3COMP	XXXX.X FT/SEC FOR EACH	DEC ONLY
R0439	85	VG (BODY)	3COMP	XXXX.X FT/SEC FOR EACH	DEC ONLY
R0441	86	DELTA V(LV)	3COMP	XXXXX. FT/SEC FOR EACH	DEC ONLY
R0443	87	MARK DATA SHAFT,	2COMP	XXX.XX DEG	
R0444		TRUNION		XX.XXX DEG	
R0445	88	HALF UNIT SUN OR PLANET VECTOR	3COMP	.XXXXX FOR EACH	DEC ONLY
R0447	89	LANDMARK LATITUDE,	3COMP	XX.XXX DEG	DEC ONLY
R0449		LONGITUDE/2,		XX.XXX DEG	
R0450		ALTITUDE		XXX.XX NAUT MI	
R0451	90	Y	3COMP	XXX.XX NM	DEC ONLY
R0453		Y DOT		XXXX.X FPS	
R0454		PSI		XXX.XX DEG	
R0455	91	CDU ANGLES SHAFT,	2COMP	XXX.XX DEG	
R0456		TRUNION		XX.XXX DEG	
R0457	92	NEW OPTICS ANGLES SHAFT,	2COMP	XXX.XX DEG	
R0458		TRUNION		XX.XXX DEG	
R0459	93	DELTA GYRO ANGLES	3COMP	XX.XXX DEG FOR EACH	
R0460	94	NEW OPTICS ANGLES SHAFT	2COMP	XXX.XX DEG	
R0461		TRUNNION		XX.XXX DEG	
R0462	95	PREFERRED ATTITUDE ICDU ANGLES	3COMP	XXX.XX DEG FOR EACH	
R0463	96	+X-AXIS ATTITUDE ICDU ANGLES	3COMP	XXX.XX DEG FOR EACH	
R0464	97	SYSTEM TEST INPUTS	3COMP	XXXXX. FOR EACH	
R0465	98	SYSTEM TEST RESULTS AND INPUTS	3COMP	XXXXX.	
R0466				.XXXXX	
R0467				XXXXX.	
R0468	99	RMS IN POSITION	3COMP	XXX.XX NAUT M_1	DEC ONLY
R0470		RMS IN VELOCITY		XXXX.X FT/SEC	
R0471		RMS OPTION		XXXXX.	

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P0472 REGISTERS AND SCALING FOR NORMAL NOUNS

R0473	NOUN	REGISTER	SCALE TYPE
R0474	00	NOT IN USE	
R0475	01	SPECIFY ADDRESS	B
R0476	02	SPECIFY ADDRESS	C
R0477	03	SPECIFY ADDRESS	D
R0478	04	SPARE	
R0479	05	DSPTEM1	H
R0480	06	OPTION1	A
R0481	07	XREG	A
R0482	08	ALMCADR	A
R0483	09	FAILREG	A
R0484	10	SPECIFY CHANNEL	A
R0485	11	SPARE	
R0486	12	OPTIONX	A
R0487	13	SPARE	
R0488	14	SPARE	
R0489	15	INCREMENT ADDRESS	A
R0490	16	DSPTEMX	C
R0491	17	CPHIX	D
R0492	18	THETAD	D
R0493	19	THETAD	D
R0494	20	CDUX	D
R0495	21	PIPAX	C
R0498	22	THETAD	D
R0497	23	SPARE	
R0498	24	DSPTEM2 +1	K
R0499	25	DSPTEM1	C
R0500	26	DSPTEM1	A
R0501	27	SMODE	C
R0502	28	SPARE	
R0503	29	DSPTEM1	D
R0504	30	DSPTEM1	C
R0505	31	DSPTEM1	K
R0506	32	-TPER	K
R0507	33	TIG	K
R0508	34	DSPTEM1	K
R0509	35	TTOGO	K
R0510	36	TIME2	K
R0511	37	TTPI	K
R0512	38	TET	K
R0513	39	T3TOT4	K

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P0514 REGISTERS AND SCALING FOR MIXED NOUNS

R0515	NOUN	COMP	REGISTER	SCALE TYPE
R0516	40	1	TTOGO	L
R0517		2	VGDISP	S
R0518		3	DVTOTAL	S
R0519	41	1	DSPTEM1	D
R0520		2	DSPTEM1 +1	E
R0521	42	1	HAPO	Q
R0522		2	HPER	Q
R0523		3	VGDISP	S
R0524	43	1	LAT	H
R0525		2	LONG	H
R0526		3	ALT	Q
R0527	44	1	HAPOX	Q
R0528		2	HPERX	Q
R0529		3	TFF	L
R0530	45	1	VHFCNT	PP
R0531		2	TTOGO	L
R0532		3	+MGA	H
R0533	46	1	DAPDATR1	A
R0534		2	DAPDATR2	A
R0535	47	1	CSMMASS	KK
R0536		2	LEMMASS	KK
R0537	48	1	PACTOFF	FF
R0538		2	YACTOFF	FF
R0539	49	1	N49DISP	Q
R0540		2	N49DISP +2	S
R0541		3	N49DISP +4	C
R0542	50	1	RSP-RREC	LL
R0543		2	HPERX	Q
R0544		3	TFF	L
R0545	51	1	RHOSB	H
R0546		2	GAMMASB	H
R0547	52	1	ACTCENT	H
R0548	53	1	RANGE	JJ
R0549		2	RRATE	S
R0550		3	RTHETA	H
R0551	54	1	RANGE	JJ
R0552		2	RRATE	S
R0553		3	RTHETA	H
R0554	55	1	NN1	C
R0555		2	ELEV	H
R0556		3	CENTANG	H
R0557	56	1	RTEGAM2D	H
R0558		2	RTEDVD	P
R0559	57	1	DELTAR	Q
R0560	58	1	POSTTPI	Q
R0561		2	DELVTPI	S

R0562		3	DELVTPF	S
R0563	59	1	DVLOS	S
R0564		2	DVLOS +2	S
R0565		3	DVLOS +4	S
R0566	60	1	GMAX	T
R0567		2	VPRED	P
R0566		3	GAMMAEI	H
R0569	61	1	LAT(SPL)	H
R0570		2	LNG(SPL)	H
R0571		3	HEADSUP	C
R0572	62	1	VMAGI	P
R0573		2	HDOT	P
R0574		3	ALTI	Q
R0575	63	1	RTGO	LL
R0576		2	VIO	P
R0577		3	TTE	L
R0578	64	1	D	MM
R0579		2	VMAGI	P
R0580		3	RTGON64	LL
R0581	65	1	SAMPTIME	K
R0582		2	SAMPTIME	K
R0583		3	SAMPTIME	K
R0584	66	1	ROLLC	H
R0585		2	XRNGERR	VV
R0586		3	DNRNGERR	LL
R0587	67	1	RTGON67	LL
R0588		2	LAT	H
R0589		3	LONG	H
R0590	68	1	ROLLC	H
R0591		2	VMAGI	P
R0592		3	RDOT	UU
R0593	69	1	ROLLC	H
R0594		2	Q7	MM
R0595		3	VL	UU
R0596	70	1	STARCODE	A
R0597		2	LANDMARK	A
R0596		3	HORIZON	A
R0599	71	1	STARCODE	A
R0600		2	LANDMARK	A
R0601		3	HORIZON	A
R0602	72	1	THETZERO	H
R0603		2	DELHITE	Q
R0604		3	OPTION2	C
R0605	73	SPARE		
R0606	74	SPARE		
R0607	75	SPARE		
R0608	76	SPARE		
R0609	77	SPARE		
R0610	78	SPARE		
R0611	79	SPARE		

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R0612	80	1	TTOGO	L
R0613		2	VGDISP	P
R0614		3	DVTOTAL	P
R0615	81	1	DELVLVC	S
R0616		2	DELVLVC +2	S
R0617		3	DELVLVC +4	S
R0618	82	SPARE		
R0619	83	1	DELVIMU	S
R0620		2	DELVIMU +2	S
R0621		3	DELVIMU +4	S
R0622	84	1	DELVOV	S
R0623		2	DELVOV +2	S
R0624		3	DELVOV +4	S
R0625	85	1	VGBODY	S
R0626		2	VGBODY +2	S
R0627		3	VGBODY +4	S
R0628	86	1	DELVLVC	P
R0629		2	DELVLVC +2	P
R0630		3	DELVLVC +4	P
R0631	87	1	MRKBUF1 +3	D
R0632		2	MRKBUF1 +5	J
R0633	88	1	STAR	B
R0634		2	STAR +2	B
R0635		3	STAR +4	B
R0636	89	1	LANDLAT	G
R0637		2	LANDLONG	G
R0638		3	LANDALT	JJ
R0639	90	1	RANGE	JJ
R0640		2	RRATE	S
R0641		3	RTHETA	H
R0642	91	1	CDUS	D
R0643		2	CDUT	J
R0644	92	1	SAC	D
R0645		2	PAC	J
R0646	93	1	OGC	G
R0647		2	OGC +2	G
R0648		3	OGC +4	G
R0649	94	1	MRKBUF1 +3	D
R0650		2	MRKBUF1 +5	J
R0651	95	1	PRAXIS	D
R0652		2	PRAXIS +1	D
R0653		3	PRAXIS +2	D
R0654	96	1	CPHIX	D
R0655		2	CPHIX +1	D
R0656		3	CPHIX +2	D
R0657	97	1	D5PTEM1	C
R0658		2	D5PTEM1 +1	C
R0659		3	D5PTEM1 +2	C
R0660	98	1	D5PTEM2	C
R0661		2	D5PTEM2 +1	B

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R0662           3       DSPTEM2 +2      C
R0663   99      1       WWPOS           XX
R0664           2       WWVEL           YY
R0665           3       WWOPT           C
```

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P0666 NOUN SCALES AND FORMATS

	-SCALE TYPE- UNITS	DECIMAL FORMAT	PRECISION -- AGC FORMAT
R0667 R0668 R0669	----------	----------	-- ----------
R0670 R0671	-A- OCTAL	XXXXX	SP OCTAL
R0672 R0673 R0674	-B- FRACTIONAL	.XXXXX (MAX .99996)	SP BIT 1 = 2^{-14} UNITS
R0675 R0676 R0677	-C- WHOLE	XXXXX. (MAX 16383.)	SP BIT 1 = 1 UNIT
R0678 R0679 R0680 R0681	-D- CDU DEGREES	XXX.XX DEGREES (MAX 359.99)	SP BIT 1 = $360/2^{15}$ DEGREES (USES 15 BITS FOR MAGNITUDE AND 2-S COMP.)
R0682 R0683 R0684	-E- ELEVATION DEGREES	XX.XXX DEGREES (MAX 89.999)	SP BIT 1 = $90/2^{14}$ DEGREES
R0685 R0686 R0687	-F- DEGREES (180)	XXX.XX DEGREES (MAX 179.99)	SP BIT 1 = $180/2^{14}$ DEGREES
R0688 R0689 R0690 R0691	-G- DP DEGREES(90)	XX.XXX DEGREES	DP BIT 1 OF LOW REGISTER = $360/2^{28}$ DEGREES
R0692 R0693 R0694 R0695	-H- DP DEGREES (360)	XXX.XX DEGREES (MAX 359.99)	DP BIT 1 OF LOW REGISTER = $360/2^{26}$ DEGREES
R0696 R0697 R0698 R0699 R0700 R0701 R0702 R0703 R0704	-J- Y OPTICS DEGREES	XX.XXX DEGREES (BIAS OF 19.775 DEGREES ADDED FOR DISPLAY, SUBTRACTED FOR LOAD.) NOTE' NEGATIVE NUMBERS CANNOT BE LOADED.	SP BIT 1 = $90/2^{15}$ DEGREES (USES 15 BITS FOR MAGNITUDE AND 2-S COMP.)
R0705	-K-		

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R0706	TIME (HR, MIN, SEC)	00XXX. HR	DP BIT 1 OF LOW REGISTER =
R0707		000XX. MIN	10^{-2} SEC
R0708		0XX.XX SEC	
R0709		(DECIMAL ONLY.	
R0710		MAX MIN COMP=59	
R0711		MAX SEC COMP=59.99	
R0712		MAX CAPACITY=745 HRS	
R0713		39 MINS	
R0714		14.55 SECS.	
R0715		WHEN LOADING, ALL 3	
R0716		COMPONENTS MUST BE	
R0717		SUPPLIED.)	
R0718	-L-		
R0719	TIME (MIN/SEC)	XX(B)XX MIN/SEC	DP BIT 1 OF LOW REGISTER =
R0720		(B IS A BLANK	10^{-2} SEC
R0721		POSITION, DECIMAL	
R0722		ONLY, DISPLAY OR	
R0723		MONITOR ONLY. CANNOT	
R0724		BE LOADED.	
R0725		MAX MIN COMP=59	
R0726		MAX SEC COMP=59	
R0727		VALUES GREATER THAN	
R0728		59 MIN 59 SEC	
R0729		ARE DISPLAYED AS	
R0730		59 MIN 59 SEC.)	
R0731	-M-		
R0732	TIME (SEC)	XXX.XX SEC	SP BIT 1 = 10^{-2} SEC
R0733		(MAX 163.83)	
R0734	-N-		
R0735	TIME(SEC) DP	XXX.XX SEC	DP BIT 1 OF LOW REGISTER =
R0736			10^{-2} SEC
R0737			
R0738	-P-		
R0739	VELOCITY 2	XXXXX. FEET/SEC	DP BIT 1 OF HIGH REGISTER =
R0740		(MAX 41994.)	2^{-7} METERS/CENTI-SEC
R0741			
R0742	-Q-		
R0743	POSITION 4	XXXX.X NAUTICAL MILES	DP BIT 1 OF LOW REGISTER =
R0744			2 METERS
R0745	-S-		
R0746	VELOCITY 3	XXXX.X FT/SEC	DP BIT 1 OF HIGH REGISTER =
R0747			2^{-7} METERS/CENTI-SEC
R0748			

R0749	-T-		
R0750	G	XXX.XX G	SP BIT 1 = 10^{-2} G
R0751		(MAX 163.83)	
R0752	-FF-		
R0753	TRIM DEGREES	XXX.XX DEG.	SP LOW ORDER BIT = 85.41 SEC
R0754		(MAX 388.69)	OF ARC
R0755	-GG-		
R0756	INERTIA	XXXXXBB. SLUG FT SQ	SP FRACTIONAL PART OF
R0757		(MAX 07733BB.)	2^{20} 2^{2}
R0758			2 KG M
R0759	-II-		
R0760	THRUST MOMENT	XXXXXBB. FT LBS	SP FRACTIONAL PART OF 2^{20}
R0761		(MAX 07733BB.)	NEWTON METER
R0762	-JJ-		
R0763	POSITION5	XXX.XX NAUT MI	DP BIT 1 OF LOW REGISTER =
R0764			2 METERS
R0765	-KK-		
R0766	WEIGHT2	XXXXX. LBS	SP FRACTIONAL PART OF 2^{16} KG
R0767	-LL-		
R0768	POSITION6	XXXX.X NAUT MI	DP BIT 1 OF LOW REG =
R0769			
R0770			$\frac{(6,373,338)(2(PI))X2^{-28}}{1852}$
R0771			
R0772			
R0773			NAUT. MI.
R0774	-MM-		
R0775	DRAG ACCELERATION	XXX.XX G	DP BIT 1 OF LOW REGISTER =
R0776		MAX (024.99)	$25X2^{-28}$ G
R0777			
R0778	-PP-		
R0779	2 INTEGERS	+XXBYY	DP BIT 1 OF HIGH REGISTER =
R0780		(B IS A BLANK	1 UNIT OF XX
R0781		POSITION. DECIMAL	BIT 1 OF LOW REGISTER =
R0782		ONLY, DISPLAY OR	1 UNIT OF YY
R0783		MONITOR ONLY. CANNOT	(EACH REGISTER MUST
R0784		BE LOADED.)	CONTAIN A POSITIVE INTEGER
R0785		(MAX 99_B99)	LESS THAN 100)
R0786	-UU-		
R0787	VELOCITY/2VS	XXXXX. FEET/SEC	DP FRACTIONAL PART OF
R0788		(MAX 51532.)	2VS FEET/SEC
R0789			(VS = 25766.1973)

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```
P0790   -VV-
R0791   POSITION8          XXXX.X NAUT MI      DP BIT 1 OF LOW REGISTER =
R0792                                                          -28
R0793                                          4 X 6,373,338 X 2
R0794                                          ------------------
R0795                                                1852
R0796                                          NAUT MI

R0797   -XX-
R0798   POSITION 9          XXX.XX NAUT MI      DP BIT 1 OF LOW REGISTER =
R0799                      (MAX 283.09)             -9
R0800                                          2    METERS

R0801   -YY-
R0802   VELOCITY 4          XXXX.X FEET/SEC     DP FRACTIONAL PART OF
R0803                      (MAX 328.0)           METERS/CENTI-SEC

R0804   THAT-S ALL ON THE NOUNS.
```

L ASSEMBLY AND OPERATION INFORMATION USER'S PAGE NO. 21 E0

P0805 ALARM CODES FOR 504

R0808 REPORT DEFICIENCIES TO JOHN SUTHERLAND " MIT 817-884-6900 X1458

R0807	*9	*18	*60	*25 COLUMN
R0809	CODE	* TYPE	SET BY	ALARM ROUTINE
R0811	00110	NO MARK SINCE LAST MARK REJECT	SXTMARK	ALARM
R0813	00112	MARK NOT BEING ACCEPTED	SXTMARK	ALARM
R0815	00113	NO INBITS	SXTMARK	ALARM
R0817	00114	MARK MADE BUT NOT DESIRED	SXTMARK	ALARM
R0819 R0821	00115	OPTICS TORQUE REQUESTWITH SWITCH NOT AT CGC	EXT VERB OPTICS CDU	ALARM
R0822 R0824	00118	OPTICS SWITCH ALTERED BEFORE 15 SEC ZERO TIME ELAPSED.	T4RUPT	ALARM
R0825 R0827	00117	OPTICS TORQUE REQUEST WITH OPTICS NOT AVAILABLE (OPTIND=-0)	EXT VERB OPTICS CDU	ALARM
R0828 R0830	00120	OPTICS TORQUE REQUEST WITH OPTICS NOT ZEROED	T4RUPT	ALARM
R0831	00121	CDUS NO GOOD AT TIME OF MARK	SXTMARK	ALARM
R0833	00122	MARKING NOT CALLED FOR	SXTMARK	ALARM
R0835	00124	PIT TPI SEARCH - NO SAFE PERICTR HERE.	TPI SEARCH	ALARM
R0837	00205	BAD PIPA READING	SERVICER	ALARM
R0839 R0841	00206	ZERO ENCODE NOT ALLOWED WITH COARSE ALIGN + GIMBAL LOCK	IMU MODE SWITCHING	ALARM
R0842	00207	ISS TURNON REQUEST NOT PRESENT FOR 90 SEC	T4RUPT	ALARM
R0844	00210	IMU NOT OPERATING	IMU MODE SWITCH, IMU-2, R02, P51	ALARM,VARALARM
R0848	00211	COARSE ALIGN ERROR - DRIVE δ 2 DEGREES	IMU MODE SWITCH	ALARM
R0848	00212	PIPA FAIL BUT PIPA IS NOT BEING USED	IMU MODE SWITCH,T4RPT	ALARM
R0850	00213	IMU NOT OPERATING WITH TURN-ON REQUEST	T4RUPT	ALARM
R0852	00214	PROGRAM USING IMU WHEN TURNED OFF	T4RUPT	ALARM
R0854	00215	PREFERRED ORIENTATION NOT SPECIFIED	P52,P54	ALARM
R0858	00217	BAD RETURN FROM STALL ROUTINES.	CURTAINS	ALARM2
R0858	00220	IMU NOT ALIGNED - NO REFSMMAT	R02,P51	VARALARM
R0880	00401	DESIRED GIMBAL ANGLES YIELD GIMBAL LOCK	IMP ALIGN, IMU-2	ALARM
R0882	00404	TARGET OUT OF VIEW - TRUN ANGLE δ 90 DEG	R52	PRIOLARM
R0864	00405	TWO STARS NOT AVAILABLE	P52,P54	ALARM
R0888	00406	REND NAVIGATION NOT OPERATING	R21,R23	ALARM
R0888	00407	AUTO OPTICS REQUEST TRUN ANGLE δ 50 DEG.	R52	ALARM
R0870	00420	THIRD CALL TO ORBITAL INTEGRATION	ALL CALLS TO INTEG	*
R0872	00421	W-MATRIX OVERFLOW	INTEGRV	ALARM
R0874	00605	NUMBER OF ITERATIONS EXCEEDS LOOP MAXIMUM	P32,P72,	VARALARM
R0878	00611	NO TIG FOR GIVEN ELEV ANGLE	P34,P74	VARALARM
R0878	00612	STATE VECTOR IN WRONG SPHERE OF INFLUENCE	P37	VARALARM
R0880	00613	REENTRY ANGLE OUT OF LIMITS	P37	VARALARM
R0883	01103	* UNUSED CCS BRANCH EXECUTED	ABORT	ALARM2
R0885	01104	* DELAY ROUTINE BUSY	EXEC	BAILOUT
R0887	01105	DOWNLINK TOO FAST	T4RUPT	ALARM
R0889	01106	UPLINK TOO FAST	T4RUPT	ALARM

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R0891	01107	PHASE TABLE FAILURE. ASSUME	RESATRT	ALARM
R0693		ERASABLE MEMORY IS DESTROYED		
R0694	01201	* EXECUTIVE OVERFLOW-NO VAC AREAS	EXEC	BAILOUT
R0696	01202	* EXECUTIVE OVERFLOW-NO CORE SETS	EXEC	BAILOUT
R0696	01203	* WAITLIST OVERFLOW-TOO MANY TASKS	WAITLIST	BAILOUT
R0900	01206	* SECOND JOB ATTEMPTS TO GO TO SLEEP	PINBALL	POODOO
R0902		VIA KEYBOARD AND DISPLAY PROGRAM		
R0903	01207	* NO VAC AREA FOR MARKS	SXTMARK	BAILOUT
R0905	01210	* TWO PROGRAMS USING DEVICE AT SAME TIME	IMU MODE SWITCH	POODOO
R0907	01211	* ILLEGAL INTERRUPT OF EXTENDED VERB	SXTMARK	BAILOUT
R0909	01301	ARCSIN-ARCCOS ARGUMENT TOO LARGE	INTERPRETER	ALARM
R0911	01302	* SQRT CALLED WITH NEGATIVE ARGUMENT.ABORT	INTERPRETER	POODOO
R0913	01407	VG INCREASING	S40.6	ALARM
R0915	01426	IMU UNSATISFACTORY	P61, P62	ALARM
R0917	01427	IMU REVERSED	P61, P62	ALARM
R0919	01501	* KEYBOARD AND DISPLAY ALARM DURING	PINBALL	POODOO
R0921		INTERNAL USE (NVSUB). ABORT.		
R0922	01502	* ILLEGAL FLASHING DISPLAY	GOPLAY	POODOO
R0924	01520	V37 REQUEST NOT PERMITTED AT THIS TIME	V37	ALARM
R0926	01600	OVERFLOW IN DRIFT TEST	OPT PRE ALIGN CALIB	ALARM
R0926	01601	* BAD IMU TORQUE - ABORT	OPT PRE ALIGN CALIB	ALARM
R0930	01602	BAD OPTICS DURING VERIFICATION	OPTALGN CALIB (CSM)	ALARM
R0932	01703	INSUF. TIME FOR INTEG., TIG WAS SLIPPED	R41	ALARM
R0934	01706	STAGE VERIFY DISCRETE DOES NOT AGREE	R03	"
R0936	01707	CHECKLIST 203 NOT PERFORMED.	R61	"
R0938	03777	ICDU FAIL CAUSED THE ISS WARNING	T4RUPT	VARALARM
R0940	04777	ICDU , PIPA FAILS CAUSED THE ISS WARNING	T4RUPT	VARALARM
R0942	07777	IMU FAIL CAUSED THE ISS WARNING	T4RUPT	VARALARM
R0944	10777	IMU , PIPA FAILS CAUSED THE ISS WARNING	T4RUPT	VARALARM
R0946	13777	IMU , ICDU FAILS CAUSED THE ISS WARNING	T4RUPT	VARALARM
R0948	14777	IMU,ICDU,PIPA FAILS CAUSED THE ISSWNING	T4RUPT	VARALARM
R0950		* INDICATES ABORT TYPE.ALL OTHERS ARE NON-ABORTIVE		

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P0951 CHECKLIST CODES FOR 504

R0952 PLEASE REPORT ANY DEFICIENCIES IN THIS LIST TO JOHN SUTHERLAND

R0953 *9 *17 *28 COLUMN

R0954 R1 CODE ACTION TO BE EFFECTED

R0955 00014 KEY IN FINE ALIGNMENT OPTION
R0956 00015 PERFORM CELESTIAL BODY ACQUISITION
R0957 00016 KEY IN TERMINATE MARK SEQUENCE
R0958 00041 SWITCH CM/SM SEPARATION TO UP
R0959 00062 SWITCH AGC POWER DOWN
R0960 00202 PERFORM GNCS AUTOMATIC MANEUVER
R0961 00203 SWITCH TO CMC-AUTO
R0962 00204 PERFORM SPS GIMBAL TRIM
R0963 00403 SWITCH OPTICS TO MANUAL OR ZERO
R0964 SWITCH DENOTES CHANGE POSITION OF A CONSOLE SWITCH
R0965 PERFORM DENOTES START OR END OF A TASK
R0966 KEY IN DENOTES KEY IN OF DATA THRU THE DSKY

L ASSEMBLY AND OPERATION INFORMATION

P0967 OPTION CODES FOR 504

R0968 PLEASE REPORT ANY DEFICIENCIES IN THIS LIST TO JOHN SUTHERLAND

R0969 THE SPECIFIED OPTION CODES WILL BE FLASHED IN COMPONENT R1 IN
R0970 CONJUNCTION WITH VERB04NOUN06 TO REQUEST THE ASTRONAUT TO LOAD INTO
R0971 COMPONENT R2 THE OPTION HE DESIRES.

R0972	*9	*17	*52	*11	*25 COLUMN
R0974	OPTION				
R0975	CODE	PURPOSE	INPUT FOR COMPONENT 2	PROGRAM(S)	APPLICABILITY
R0977	00001	SPECIFY IMU ORIENTATION	1=PREF 2=NOM 3=REFSMMAT	P50'S	ALL
R0979	00002	SPECIFY VEHICLE	1=THIS 2=OTHER	P21,R30	ALL
R0981	00003	SPECIFY TRACKING ATTITUDE	1=PREFERRED 2=OTHER	R63	ALL
R0983	00004	SPECIFY RADAR	1=RR 2=LR	R04	SUNDANCE + LUMINARY
R0985	00005	SPECIFY SOR PHASE	1=FIRST 2=SECOND	P38	COLOSSUS + LUMINARY
R0987	00006	SPECIFY RR COARSE ALIGN OPTION	1=LOCKON 2=CONTINUOUS DESIG.	V41N72	SUNDANCE + LUMINARY
R0989	00007	SPECIFY PROPULSION SYSTEM	1=SPS 2=RCS	P37	COLOSSUS
R0991	00010	SPECIFY ALIGNMENT MODE	0=ANY TIME 1=REFSMMAT +G	P57	LUMINARY
R0993			2=TWO BODIES 3=ONE BODY + G		
R0994	00011	SPECIFY SEPARATION MONITOR PHASE	1=DELTAV 2=STATE VECTOR UPDATE	P46	LUMINARY
R0996	00012	SPECIFY CSM ORBIT OPTION	1=NO ORBIT CHANGE 2=CHANGE ORBIT TO PASS OVER LM	P22	LUMINARY
R0998					

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS USER'S PAGE NO. 1 E0

```
0001                        44,2000  44,2000   FIXED    MEMORY 120000 - 167777
0002  REF  1                                             COUNT  BANKSUM

R00025          MODULE 1 CONTAINS BANKS 0 THROUGH 5

0003                           4000                      BLOCK  02
0004                           4000           FFTAG1     EQUALS
0005                           4000           FFTAG2     EQUALS
0006                           4000           FFTAG3     EQUALS
0007                           4000           FFTAG4     EQUALS
0008                           4000           FFTAG7     EQUALS
0009                           4000           FFTAG8     EQUALS
0010                           4000           FFTAG9     EQUALS
0011                           4000           FFTAG10    EQUALS
0012                           4000           FFTAG12    EQUALS
0013    79 WORDS LEFT          5660   05660 1             BNKSUM 02
0013                           5661   05661 0
0014                           6000                      BLOCK  03
0015                           6000           FFTAG5     EQUALS
0016                           6000           FFTAG6     EQUALS
0017    21 WORDS LEFT          7752   07752 0             BNKSUM 03
0017                           7753   07753 1
0018                        00,2000                      BANK   00
0019                        00,2000           DLAYJOB    EQUALS
0020     7 WORDS LEFT       00,3770   03770 1             BNKSUM 00
0020                        00,3771   03771 0
0021                        01,2000                      BANK   01
0022                        01,2000           RESTART    EQUALS
0023     7 WORDS LEFT       01,3770   03770 1             BNKSUM 01
0023                        01,3771   03771 0
0024                        04,2000                      BANK   4
0025                        04,2000           VERB37     EQUALS
0026                        04,2000           CONICS1    EQUALS
0027                        04,2000           PINBALL4   EQUALS
0028                        04,2000           R36LM      EQUALS
0029                        04,2000           INTPRET2   EQUALS
00291                       04,2000           IMUCAL1    EQUALS
00292                       04,2000           STBLEORB   EQUALS
00293                       04,2000           E/PROG     EQUALS
00294                       04,2000           MIDDGIM    EQUALS
0030    87 WORDS LEFT       04,3650   03650 1             BNKSUM 04
0030                        04,3651   03651 0
```

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS


```
0031                    05,2000                         BANK    5
0032                    05,2000             FRANDRES    EQUALS
0033                    05,2000             DOWNTELM    EQUALS
00335                   05,2000             DAPMASS     EQUALS
0034    112 WORDS LEFT  05,3617  03617 1               BNKSUM  05
0034                    05,3620  03620 0
R00345          MODULE 2 CONTAINS BANKS 6 THROUGH 13

0035                    06,2000                         BANK    6
0036                    06,2000             IMUCOMP     EQUALS
0037                    06,2000             T4RUP       EQUALS
00375                   06,2000             IMUCAL2     EQUALS
0038    66 WORDS LEFT   06,3651  03651 0               BNKSUM  06
0038                    06,3652  03652 0
0039                    07,2000                         BANK    7
0040                    07,2000             SXTMARKE    EQUALS
0041                    07,2000             R02         EQUALS
0042                    07,2000             MODESW      EQUALS
0043                    07,2000             XANG        EQUALS
0044                    07,2000             KEYRUPT     EQUALS
0045    48 WORDS LEFT   07,3717  03717 0               BNKSUM  07
0045                    07,3720  03720 1
0046                    10,2000                         BANK    10
0047                    10,2000             DISPLAYS    EQUALS
0048                    10,2000             PHASETAB    EQUALS
0049                    10,2000             COMCOM2     EQUALS
0050                    10,2000             SXTMARK1    EQUALS
0051                    10,2000             P60S4       EQUALS
0052                    10,2000             OPTDRV      EQUALS
0053    61 WORDS LEFT   10,3702  03702 1               BNKSUM  10
0053                    10,3703  03703 0
0054                    11,2000                         BANK    11
0055                    11,2000             ORBITAL     EQUALS
0056                    11,2000             ORBITAL1    EQUALS      CONSTANTS
0057                    11,2000             INTVEL      EQUALS
0058                    11,2000             S52/2       EQUALS
0059    46 WORDS LEFT   11,3721  03721 0               BNKSUM  11
0059                    11,3722  03722 0
0060                    12,2000                         BANK    12
0061                    12,2000             CONICS      EQUALS
```

```
0062     34 WORDS LEFT      12,3735   03735 0          BNKSUM 12
0062                        12,3736   03736 0
0063                        13,2000                    BANK   13
0064                        13,2000           P76LOC   EQUALS
0065                        13,2000           LATLONG  EQUALS
0066                        13,2000           INTINIT  EQUALS
0067                        13,2000           SR52/1   EQUALS
00675                       13,2000           ORBITAL2 EQUALS
0069      6 WORDS LEFT      13,3771   03771 0          BNKSUM 13
0069                        13,3772   03772 0

R0070    SPACER

R00705             MODULE 3 CONTAINS BANKS 14 THROUGH 21

0071                        14,2000                    BANK   14
0072                        14,2000           STARTAB  EQUALS
0073                        14,2000           RT53     EQUALS
0074                        14,2000           P50S1    EQUALS
0075     27 WORDS LEFT      14,3744   03744 0          BNKSUM 14
0075                        14,3745   03745 1
0076                        15,2000                    BANK   15
0077                        15,2000           P50S     EQUALS
0078                        15,2000           ETRYDAP  EQUALS
0079                        15,2000           S52/3    EQUALS
0060      3 WORDS LEFT      15,3774   03774 0          BNKSUM 15
0060                        15,3775   03775 1
0081                        16,2000                    BANK   16
0062                        16,2000           P40S1    EQUALS
0063                        16,2000           DAPROLL  EQUALS
0064                        16,2000           P50S2    EQUALS
0065     30 WORDS LEFT      16,3741   03741 0          BNKSUM 16
0065                        16,3742   03742 0
0086                        17,2000                    BANK   17
0087                        17,2000           DAPS4    EQUALS
0066                        17,2000           DAPS5    EQUALS
0069                        17,2000           DAPS7    EQUALS
0090     11 WORDS LEFT      17,3764   03764 1          BNKSUM 17
0090                        17,3765   03765 0
0091                        20,2000                    BANK   20
```

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS USER'S PAGE NO. 4 E0

```
0092                    20,2000             DAPS8    EQUALS
0093                    20,2000             DAPS1    EQUALS
0094                    20,2000             DAPS2    EQUALS
0095  52 WORDS LEFT     20,3713  03713 1             BNKSUM 20
0095                    20,3714  03714 0
0096                    21,2000                      BANK   21
0097                    21,2000             DAPS3    EQUALS
0098                    21,2000             MYSUBS   EQUALS
0099  22 WORDS LEFT     21,3751  03751 1             BNKSUM 21
0099                    21,3752  03752 1
R00995        MODULE 4 CONTAINS BANKS 22 THROUGH 27

0100                    22,2000                      BANK   22
0101                    22,2000             RTBCODES EQUALS
0102                    22,2000             RTBCODE1 EQUALS
0103                    22,2000             DAPS8    EQUALS
0104                    22,2000             APOPERI  EQUALS
0105                    22,2000             P40S5    EQUALS
0106                    22,2000             KALCMON2 EQUALS
0107                    22,2000             KALCMON1 EQUALS
0108  5 WORDS LEFT      22,3772  03772 0             BNKSUM 22
0108                    22,3773  03773 1
0109                    23,2000                      BANK   23
0110                    23,2000             P20S2    EQUALS
0111                    23,2000             INFLIGHT EQUALS
0112                    23,2000             COMGEOM1 EQUALS
0113                    23,2000             POWFLITE EQUALS
0114                    23,2000             POWFLIT1 EQUALS
0115                    23,2000             RENDGUID EQUALS
0116                    23,2000             POWFLIT2 EQUALS
0117                    23,2000             R30LOC   EQUALS
0118                    23,2000             P11FOUR  EQUALS
0119  42 WORDS LEFT     23,3725  03725 1             BNKSUM 23
0119                    23,3726  03726 1
0120                    24,2000                      BANK   24
0121                    24,2000             LOADDAP  EQUALS
0122                    24,2000             P40S     EQUALS
0125  60 WORDS LEFT     24,3703  03703 0             BNKSUM 24
0125                    24,3704  03704 1
0126                    25,2000                      BANK   25
```

```
0127                        25,2000             REENTRY  EQUALS
0128    9 WORDS LEFT        25,3766  03766 0             BNKSUM 25
0128                        25,3767  03767 1
0129                        26,2000                     BANK   26
0130                        26,2000             INTPRET1 EQUALS
0131                        26,2000             REENTRY1 EQUALS
0132                        26,2000             P60S     EQUALS
0133                        26,2000             P60S1    EQUALS
0134                        26,2000             P60S2    EQUALS
0135                        26,2000             P60S3    EQUALS
0136                        26,2000             PLANTIN  EQUALS          LUNAR ROT
0137                        26,2000             EPHEM    EQUALS
0138                        26,2000             P05P06   EQUALS
01381                       26,2000             26P50S   EQUALS
0139    3 WORDS LEFT        26,3774  03774 0             BNKSUM 26
0139                        26,3775  03775 1

R0140

0141                        27,2000                     BANK   27
0142                        27,2000             TOF-FF   EQUALS
0143                        27,2000             TOF-FF1  EQUALS
0144                        27,2000             MANUVER  EQUALS
0145                        27,2000             MANUVER1 EQUALS
0146                        27,2000             VECPT    EQUALS
0147                        27,2000             UPDATE1  EQUALS
0148                        27,2000             UPDATE2  EQUALS
0149                        27,2000             R22S1    EQUALS
01495                       27,2000             P60S5    EQUALS
01496                       27,2000             RTE2     EQUALS
0150    19 WORDS LEFT       27,3754  03754 1             BNKSUM 27
0150                        27,3755  03755 0
R01505          MODULE 5 CONTAINS BANKS 30 THROUGH 35

0151                        30,2000                     BANK   30
0152                        30,2000             IMUSUPER EQUALS
0153                        30,2000             LOWSUPER EQUALS
0154                        30,2000             FCSTART  EQUALS          STANDARD LOCATION FOR THIS.  (FOR EXTVB)
0155                        30,2000             LOPC     EQUALS
0156                        30,2000             P20S1    EQUALS
0157                        30,2000             P20S6    EQUALS
01575                       30,2000             P40S3    EQUALS
01577                       30,2000             R35A     EQUALS
0158    1 WORDS LEFT.       30,3776  03776 1             BNKSUM 30
```

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS


```
 0159                          31,2000                        BANK    31
 0160                          31,2000          R35           EQUALS
 0161                          31,2000          RT23          EQUALS
 0162                          31,2000          P30S1A        EQUALS
 01621                         31,2000          R34           EQUALS
 0163     9 WORDS LEFT         31,3766  03766 0               BNKSUM  31
 0163                          31,3767  03767 1
 0164                          32,2000                        BANK    32
 0165                          32,2000          MSGSCAN1      EQUALS
 0166                          32,2000          RTE           EQUALS
 0167                          32,2000          DELRSPL1      EQUALS
 01675                         32,2000          IMUCAL3       EQUALS
 0168     18 WORDS LEFT        32,3755  03755 0               BNKSUM  32
 0166                          32,3756  03756 0
 0169                          33,2000                        BANK    33
 0170                          33,2000          TESTLEAD      EQUALS
 0171                          33,2000          IMUCAL        EQUALS
 0172     5 WORDS LEFT         33,3772  03772 0               BNKSUM  33
 0172                          33,3773  03773 1
 0173                          34,2000                        BANK    34
 0175                          34,2000          P11ONE        EQUALS
 0176                          34,2000          P20S3         EQUALS
 0177                          34,2000          P20S4         EQUALS
 01775                         34,2000          RTECON        EQUALS
 0176     2 WORDS LEFT         34,3775  03775 1               BNKSUM  34
 0176                          34,3776  03776 1
 0179                          35,2000                        BANK    35
 01795                         35,2000          RTECON1       EQUALS
 0160                          35,2000          C5I/CDH       EQUALS
 0161                          35,2000          P3051         EQUALS
 0162                          35,2000          P30S          EQUALS
 0163                          35,2000          R31           EQUALS
 0164                          35,2000          P1751         EQUALS
 0165     4 WORDS LEFT         35,3773  03773 1               BNKSUM  35
 0165                          35,3774  03774 0
R01655          MODULE 6 CONTAINS BANKS 36 THROUGH 43

 0166                          36,2000                        BANK    36
 0166                          36,2000          MEASINC       EQUALS
 0169                          36,2000          MEASINC1      EQUALS
```

```
0190                          36,2000           P17S     EQUALS
0191                          36,2000           RTB1     EQUALS
0192    9 WORDS LEFT          36,3766  03768 0           BNKSUM 36
0192                          36,3767  03767 1
0193                          37,2000                    BANK   37
0194                          37,2000           P20S     EQUALS
0195                          37,2000           BODYATT  EQUALS
0196                          37,2000           RENDEZ   EQUALS
0197                          37,2000           SERVICES EQUALS
01975                         37,2000           P11TWO   EQUALS
0198   15 WORDS LEFT          37,3760  03780 0           BNKSUM 37
0198                          37,3761  03781 1
0199                          40,2000                    BANK   40
0200                          40,2000           PINSUPER EQUALS
0201                          40,2000           SELFSUPR EQUALS
0202                          40,2000           PINBALL1 EQUALS
0203   32 WORDS LEFT          40,3737  03737 1           BNKSUM 40
0203                          40,3740  03740 1
0204                          41,2000                    BANK   41
0205                          41,2000           PINBALL2 EQUALS
0206   50 WORDS LEFT          41,3715  03715 1           BNKSUM 41
0206                          41,3716  03716 1
0207                          42,2000                    BANK   42
0208                          42,2000           SBAND    EQUALS
0209                          42,2000           PINBALL3 EQUALS
02095                         42,2000           EXTVBS   EQUALS
0210   58 WORDS LEFT          42,3765  03705 0           BNKSUM 42
0210                          42,3766  03708 0
0211                          43,2000                    BANK   43
0212                          43,2000           SELFCHEC EQUALS
0213                          43,2000           EXTVERBS EQUALS
0214   13 WORDS LEFT          43,3762  03762 1           BNKSUM 43
0214                          43,3763  03783 0
0215   REF   1                26,3331           HI6ZEROS EQUALS ZEROVECS    ZERO VECTOR ALWAYS IN HIGH MEMORY
0216   REF   1                04,3455           LO6ZEROS EQUALS ZEROVEC     ZERO VECTOR ALWAYS IN LOW MEMORY
0217   REF   1                26,3327           HIDPHALF EQUALS UNITX
0218   REF   1                04,3453           LODPHALF EQUALS XUNIT
0219   REF   1                26,3321           HIDP1/4  EQUALS DP1/4TH
```

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS USER'S PAGE NO. 8 E0

```
0220  REF  1                 04,3501   LODP1/4  EQUALS D1/4          2DEC .25
0221  REF  2  LAST  31        26,3327   HIUNITX  EQUALS UNITX
0222  REF  1                 26,3325   HIUNITY  EQUALS UNITY
0223  REF  1                 26,3323   HIUNITZ  EQUALS UNITZ
0224  REF  2  LAST  31        04,3453   LOUNITX  EQUALS XUNIT       2DEC .5
0225  REF  1                 04,3451   LOUNITY  EQUALS YUNIT       2DEC 0
0226  REF  1                 04,3447   LOUNITZ  EQUALS ZUNIT       2DEC 0
0227  REF  1                 11,3706   3/4LODP  EQUALS 3/4         2DEC 3.0 B-2
0228  REF  1                 30,2000             SBANK= LOWSUPER
R0229  ROPE SPECIFIC ASSIGNS OBVIATING NEED TO CHECK COMPUTER FLAG IN DETVRUZVING INTEGRATION AREA ENTRIES
0231  REF  1                 13,3036   OTHPREC  EQUALS LEMPREC
0232  REF  1                 13,2711   ATOPOTH  EQUALS ATOPLEM
0233  REF  1                 13,2636   ATOPTHIS EQUALS ATOPCSM
0234  REF  1                   0173    MOONTHIS EQUALS CMOONFLG
02345 REF  1                   0174    MOONOTH  EQUALS LMOONFLG
0235  REF  1                 13,2651   MOVATHIS EQUALS MOVEACSM
0236  REF  1                 35,3204   STATEST  EQUALS V63CALL      * TEMPORARY
0237  REF  1                 13,3022   THISPREC EQUALS CSMPREC
0238  REF  3  LAST  32        26,3327   THISAXIS =       UNITX
02365 REF  1                   4747    ERASID   EQUALS LOW10        DOWNLINK ERASABLE DUMP ID
02366 REF  1                   6214    DELAYNUM EQUALS THREE
R0239  ********************************************************************************************************************
```

R0241 THE FOLLOWING ECADRS ARE DEFINED TO FACILITATE EBANK SWITCHING. THEY ALSO MAKE IT EASIER FOR
R0243 ERASABLE CONTROL TO REARRANGE ERASABLE MEMORY WITHOUT DISRUPTING THE PROGRAMS WHICH SET EBANKS.
R0245 PRIOR TO ROPE RELEASE FIXED MEMORY CAN BE SAVED BY SETTING EACH EBXXXX =EBANKX (X=4,5,6,7).EBANKX OF COURSE
R0247 WILL BE THE BANK WHERE THE ERASABLES REFERENCED IN EBXXXX WILL BE STORED.

```
0249                         07,2000             BANK   7
0250  REF  1                 E7,1674             EBANK= MARKDOWN
0251  REF  2  LAST  32        07,2000  03674 1  EBMARKDO ECADR  MARKDOWN
0252  REF  1                 E7,1725             EBANK= MRKBUF1
0253  REF  2  LAST  32        07,2001  03725 1  EBMRKBUF ECADR  MRKBUF1

0254                         24,2000             BANK   24
0255  REF  1                 E7,1431             EBANK= DVCNTR
0256  REF  2  LAST  32        24,2000  03431 1  EBDVCNTR ECADR  DVCNTR
0257  REF  1                 E7,1672             EBANK= P40TMP
0258  REF  2  LAST  32        24,2001  03672 1  EBP40TMP ECADR  P40TMP

0259                         34,2000             BANK   34
0260  REF  3  LAST  32        E7,1431             EBANK= DVCNTR
0261  REF  4  LAST  32        34,2000  03431 1  EBDVCNT  ECADR  DVCNTR
0262  REF  1                 E5,1426             EBANK= OPLACES
0263  REF  2  LAST  32        34,2001  02426 0  EBOPLACE ECADR  OPLACES

0264                         37,2000             BANK   37
0265  REF  1                   1231              EBANK= RN1
```

L TAGS FOR RELATIVE SETLOC AND BLANK BANK CARDS USER'S PAGE NO. 9 Er 93

```
 0266   REF   2  LAST   32   37,2000   01231 0  EBRN1    ECADR  RN1
R0267   ********************************************************************************
```

L SUBROUTINE CALLS

0001	37,2000	SUBRO	KILERASE
0002	37,2000	SUBRO	KOOLADE
0003	37,2000	SUBRO	SVOOCH
0004	37,2000	SUBRO	PANDORA
0005	37,2000	SUBRO	DAPCSM
0006	37,2000	SUBRO	SATRAP

*** END OF MAIN PROGRAM ***

R0001 CONVENTIONS AND NOTATIONS UTILIZED FOR ERASABLE ASSIGNMENTS.

R0002 EQUALS IS USED IN TWO WAYS. IT IS OFTEN USED TO CHAIN A GROUP
R0003 OF ASSIGNMENTS SO THAT THE GROUP MAY BE MOVED WITH THE
R0004 CHANGING OF ONLY ONE CARD. EXAMPLE.

```
A0005                          X       EQUALS START
A0008                          Y       EQUALS X        +SIZE.X
A0007                          Z       EQUALS Y        +SIZE.Y
```

R0008 (X, Y, AND Z ARE CONSECUTIVE AND BEGIN AT START.)
R0009 (SIZE.X AND SIZE.Y ARE THE RESPECTIVE SIZES OF X AND Y,
R0010 USUALLY NUMERIC, IE. 1, 2, 8, 18D ETC.)
R0011 EQUALS OFTEN IMPLIES THE SHARING OF REGISTERS (DIFFERENT NAMES
R0012 AND DIFFERENT DATA). EXAMPLE.

```
A0013                          X       EQUALS Y
```

R0014 = MEANS THAT MULTIPLE NAMES HAVE BEEN GIVEN TO THE SAME DATA.
R0015 (THIS IS LOGICAL EQUIVALENCE, NOT SHARING) EXAMPLE.

```
A0016                          X       =       Y
```

R0017 THE SIZE AND UTILIZATION OF AN ERASABLE ARE OFTEN INCLUDED IN
R0018 THE COMMENTS IN THE FOLLOWING FORM. M(SIZE)N.

R0019 M REFERS TO THE MOBILITY OF THE ASSIGNMENT.
R0020 B MEANS THAT THE SYMBOL IS REFERENCED BY BASIC
R0021 INSTRUCTIONS AND THUS IS E-BANK SENSITIVE.
R0022 I MEANS THAT THE SYMBOL IS REFERENCED ONLY BY
R0023 INTERPRETIVE INSTRUCTIONS, AND IS THUS E-BANK
R0024 INSENSITIVE AND MAY APPEAR IN ANY E-BANK.

R0025 SIZE IS THE NUMBER OF REGISTERS INCLUDED BY THE SYMBOL.

R0026 N INDICATES THE NATURE OR PERMANENCE OF THE CONTENTS.
R0027 PL MEANS THAT THE CONTENTS ARE PAD LOADED.
R0028 DSP MEANS THAT THE REGISTER IS USED FOR A DISPLAY.
R0029 PRM MEANS THAT THE REGISTER IS PERMANENT, IE. IT
R0030 IS USED DURING THE ENTIRE MISSION FOR ONE
R0031 PURPOSE AND CANNOT BE SHARED.
R0032 TMP MEANS THAT THE REGISTER IS USED TEMPORARILY OR
R0033 IS A SCRATCH REGISTER FOR THE ROUTINE TO WHICH
R0034 IT IS ASSIGNED. THAT IS, IT NEED NOT BE SET
R0035 PRIOR TO INVOCATION OF THE ROUTINE NOR DOES IT
R0038 CONTAIN USEFUL OUTPUT TO ANOTHER ROUTINE. THUS

```
R0037                   IT MAY BE SHARED WITH ANY OTHER ROUTINE WHICH
R0038                   IS NOT ACTIVE IN PARALLEL.
R0039               IN  MEANS INPUT TO THE ROUTINE AND IT IS PROBABLY
R0040                   TEMPORARY FOR A HIGHER-LEVEL ROUTINE/PROGRAM.
R0041               OUT MEANS OUTPUT FROM THE ROUTINE, PROBABLY
R0042                   TEMPORARY FOR A HIGHER-LEVEL ROUTINE/PROGRAM.
```

```
P0050           SPECIAL REGISTERS.

 0051                    0000    A       EQUALS 0
 0052                    0001    L       EQUALS 1        L AND Q ARE BOTH CHANNELS AND REGISTERS.
 0053                    0002    Q       EQUALS 2
 0054                    0003    EBANK   EQUALS 3
 0055                    0004    FBANK   EQUALS 4
 0056                    0005    Z       EQUALS 5        ADJACENT TO FBANK AND BBANK FOR DXCH Z
 0057                    0006    BBANK   EQUALS 8        (DTCB) AND DXCH FBANK (DTCF).
A0058                                                   REGISTER 7 IS A ZERO-SOURCE, USED BY ZL.

 0059                    0010    ARUPT   EQUALS 10       INTERRUPT STORAGE.
 0060                    0011    LRUPT   EQUALS 11
 0061                    0012    QRUPT   EQUALS 12
 0062                    0013    SAMPTIME EQUALS 13      SAMPLED TIME 1 d 2.
 0063                    0015    ZRUPT   EQUALS 15       (13 AND 14 ARE SPARES.)
 0064                    0016    BANKRUPT EQUALS 16      USUALLY HOLDS FBANK OR BBANK.
 0065                    0017    BRUPT   EQUALS 17       RESUME ADDRESS AS WELL.

 0066                    0020    CYR     EQUALS 20
 0067                    0021    SR      EQUALS 21
 0068                    0022    CYL     EQUALS 22
 0069                    0023    EDOP    EQUALS 23       EDITS INTERPRETIVE OPERATION CODE PAIRS.
 0070                    0024    TIME2   EQUALS 24
 0071                    0025    TIME1   EQUALS 25
 0072                    0026    TIME3   EQUALS 26
 0073                    0027    TIME4   EQUALS 27
 0074                    0030    TIME5   EQUALS 30
 0075                    0031    TIME6   EQUALS 31
 0076                    0032    CDUX    EQUALS 32
 0077                    0033    CDUY    EQUALS 33
 0078                    0034    CDUZ    EQUALS 34
 0079                    0035    CDUT    EQUALS 35       OPTICS TRUNNION CDU (WAS OPTY).
 0080  REF   1           0035    OPTY    =      CDUT
 0081                    0038    CDUS    EQUALS 38       OPTICS SHAFT CDU (WAS OPTX).
 0082  REF   1           0038    OPTX    =      CDUS
 0083                    0037    PIPAX   EQUALS 37
 0084                    0040    PIPAY   EQUALS 40
 0085                    0041    PIPAZ   EQUALS 41
 0086                    0042    RMAGX   EQUALS 42
 0087                    0043    RMAGY   EQUALS 43
 0088                    0044    RMAGZ   EQUALS 44
 0089                    0045    INLINK  EQUALS 45
 0090                    0046    RNRAD   EQUALS 46
 0091                    0047    GYROCTR EQUALS 47
 0092                    0047    GYROCMD EQUALS 47
 0093                    0050    CDUXCMD EQUALS 50
 0094                    0051    CDUYCMD EQUALS 51
```

L ERASABLE ASSIGNMENTS


```
0095
0098
0097  REF  1
0098  REF  2  LAST  38
0099
0100  REF  1
0101  REF  2  LAST  38
0102
0103
0104
0105
0108
R0107          INTERPRETIVE REGISTERS ADDRESSED RELATIVE TO VAC AREA.

0108
0109
0110
0111
0112
0113
0114
```

```
0052    CDUZCMD   EQUALS 52
0053    CDUTCMD   EQUALS 53
0053    OPTYCMD   =      CDUTCMD
0053    TVCYAW    EQUALS CDUTCMD
0054    CDUSCMD   EQUALS 54
0054    TVCPITCH  EQUALS CDUSCMD
0054    OPTXCMD   =      CDUSCMD
0055    EMSD      EQUALS 55
0055    THRUST    EQUALS 55
0058    LEMONM    EQUALS 58
0057    OUTLINK   EQUALS 57
0080    ALTM      EQUALS 80

0042    LVSQUARE  EQUALS 34D
0044    LV        EQUALS 38D
0046    X1        EQUALS 38D
0047    X2        EQUALS 39D
0050    S1        EQUALS 40D
0051    S2        EQUALS 41D
0052    QPRET     EQUALS 42D
```

OPTICS TRUNNION COMMAND (WAS OPTYCMD).

SPS YAW COMMAND IN TVC MODE.
OPTICS SHAFT COMMAND (WAS OPTXCMD).
SPS PITCH COMMAND IN TVC MODE.

SQUARE OF VECTOR INPUT TO ABVAL AND UNIT
LENGTH OF VECTOR INPUT TO UNIT.
INTERPRETIVE SPECIAL REGISTERS RELATIVE
TO THE WORK AREA.

P0115 INPUT/OUTPUT CHANNELS

```
A01151                                   *** CHANNEL ZERO IS TO BE USED IN AN INDEXED OPERATION ONLY. ***
 01152  REF   1              0001        LCHAN     EQUALS L
 01153  REF   1              0002        QCHAN     EQUALS Q
 0116                        0003        HISCALAR  EQUALS 3
 0117                        0004        LOSCALAR  EQUALS 4
 0118                        0005        PYJETS    EQUALS 5
 0119                        0006        ROLLJETS  EQUALS 6
 0120                        0007        SUPERBNK  EQUALS 7
 0121                        0010        OUT0      EQUALS 10
 0122                        0011        DSALMOUT  EQUALS 11
 0123                        0012        CHAN12    EQUALS 12
 0124                        0013        CHAN13    EQUALS 13
 0125                        0014        CHAN14    EQUALS 14
 0126                        0015        MNKEYIN   EQUALS 15
 0127                        0016        NAVKEYIN  EQUALS 16
 01271                       0030        CHAN30    EQUALS 30
 01272                       0031        CHAN31    EQUALS 31
 01273                       0032        CHAN32    EQUALS 32
 0128                        0033        CHAN33    EQUALS 33
 0129                        0034        DNTM1     EQUALS 34
 0130                        0035        DNTM2     EQUALS 35
R0131  END OF CHANNEL ASSIGNMENTS
```

L ERASABLE ASSIGNMENTS

P0135 FLAGWORDS
R0136 FLAGWRD0 STATE +0 (000-014)
R0137 FLAGWRD1 STATE +1 (015-029)
R0138 FLAGWRD2 STATE +2 (030-044)
R0139 FLAGWRD3 STATE +3 (045-059)
R0140 FLAGWRD4 STATE +4 (060-074)
R0141 FLAGWRD5 STATE +5 (075-089)
R0142 FLAGWRD6 STATE +6 (090-104)
R0143 FLAGWRD7 STATE +7 (105-119)
R0144 FLAGWRD8 STATE +8D (120-134)
R0145 FLAGWRD9 STATE +9D (135-149)
A0148
R0147 SORTED LIST OF

R0148 INTERPITIVE SWITCH BIT ASSIGNMENTS

R0149 INTERPRETIVE SWITCH BIT ASSIGNMENTS
R0150 FLAGWORD DEC NUM BIT + FLAG EQUIVALENT FLAGWORDS

R0151 22DSPFLG 032D BIT 13 FLAG 2
R0152 380SW 134D BIT 1 FLAG 8
R0153 3AXISFLG 084D BIT 6 FLAG 5
R0158 ADVTRK 125D BIT 10 FLAG 8
R0157 APSESW 130D BIT 5 FLAG 8
R0159 ASTNFLAG 108D BIT 12 FLAG 7
R0161 ATTCHFLG 118D BIT 2 FLAG 7
R0164 AVEGFLAG 029D BIT 1 FLAG 1
R0165 AVEMIDSW 149D BIT 1 FLAG 9
R0168 AVFLAG 040D BIT 5 FLAG 2
R0169 CALCMAN2 043D BIT 2 FLAG 2
R0170 CALCMAN3 042D BIT 3 FLAG 2
R0171 CMDAPARM 093D BIT 12 FLAG 8
R0172 CMOONFLG 123D BIT 12 FLAG 8
R0173 CM/DSTBY 103D BIT 2 FLAG 8
R0174 COGAFLAG 131D BIT 4 FLAG 8
R0175 COMPUTER 082D BIT 8 FLAG 5
R0176 CPHIFLAG 000D BIT 15 FLAG 0
R0177 CULTFLAG 053D BIT 7 FLAG 3
R0178 CYCLESW 035D BIT 10 FLAG 2
R0179 D60R9FLG 058D BIT 2 FLAG 3
R0180 DAPBIT1 090D BIT 15 FLAG 8
R0181 DAPBIT2 091D BIT 14 FLAG 8
R0182 DIM0FLAG 059D BIT 1 FLAG 3
R0184 DMENFLG 081D BIT 9 FLAG 5
R0185 DRIFTFLG 030D BIT 15 FLAG 2
R0188 DSKYFLAG 075D BIT 15 FLAG 5

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R0187	EGSW	97D	BIT 6 FLAG 6	KNOWNFLG R57FLAG
R0189	ENG1FLAG	018D	BIT 12 FLAG 1	
R0190	ENG2FLAG	019D	BIT 11 FLAG 1	
R0191	ENGONFLG	083D	BIT 7 FLAG 5	
R0193	ERADFLAG	017D	BIT 13 FLAG 1	
R0194	ETPIFLAG	038D	BIT 7 FLAG 2	FIRSTFLG OPTNSW
R0196	F2RTB	10D	BIT 5 FLAG 0	
R0197	FINALFLG	039D	BIT 6 FLAG 2	
R0198	FIRSTFLG	38D	BIT 7 FLAG 2	ETPIFLAG OPTNSW
R0201	FREEFLAG	012D	BIT 3 FLAG 0	
R0202	GAMDIFSW	094D	BIT 11 FLAG 6	
R0204	GLOKFAIL	046D	BIT 14 FLAG 3	
R0205	GMBDRVSW	095D	BIT 10 FLAG 6	GONEPAST
R0207	GONEBY	112D	BIT 6 FLAG 7	
R0208	GONEPAST	095D	BIT 10 FLAG 6	GMBDRVSW
R0209	GRRBKFLG	085D	BIT 5 FLAG 5	
R0211	GUESSW	028D	BIT 2 FLAG 1	
R0212	GYMDIFSW	104D	BIT 1 FLAG 6	
R0213	.05GSW	102D	BIT 3 FLAG 6	
R0214	HIND	099D	BIT 6 FLAG 6	
R02152	IDLEFAIL	024D	BIT 6 FLAG 1	
R0216	IDLEFLAG	113D	BIT 7 FLAG 7	
R0217	IGNFLAG	107D	BIT 13 FLAG 7	
R0216	IMPULSW	036D	BIT 9 FLAG 2	
R0219	IMUSE	007D	BIT 6 FLAG 0	
R0220	INCORFLG	079D	BIT 11 FLAG 5	
R0221	INFINFLG	128D	BIT 7 FLAG 8	
R0222	INRLSW	100D	BIT 5 FLAG 6	
R02221	INTFLAG	151D	BIT 14 FLAG 10	
R0225	INTYPFLG	056D	BIT 4 FLAG 3	
R0227	ITSWICH	106D	BIT 14 FLAG 7	
R0229	KFLAG	014D	BIT 1 FLAG 0	
R0232	KNOWNFLG	097D	BIT 6 FLAG 6	EGSW R57FLAG
R0234	LATSW	101D	BIT 4 FLAG 6	
R0235	LMOONFLG	124D	BIT 11 FLAG 6	
R0236	LUNAFLAG	048D	BIT 12 FLAG 3	
R02395	MAXDBFLG	138D	BIT 12 FLAG 9	
R0240	MGLVFLAG	088D	BIT 2 FLAG 5	
R0241	MID1FLAG	147D	BIT 3 FLAG 9	
R0242	MIDAVFLG	148D	BIT 2 FLAG 9	
R0243	MIDFLAG	002D	BIT 13 FLAG 0	
R0244	MKOVFLAG	072D	BIT 3 FLAG 4	
R0245	MOONFLAG	003D	BIT 12 FLAG 0	
R0246	MRKIDFLG	060D	BIT 15 FLAG 4	
R0247	MRKNVFLG	066D	BIT 9 FLAG 4	
R0248	MRUPTFLG	070D	BIT 5 FLAG 4	
R0251	MWAITFLG	064D	BIT 11 FLAG 4	
R0252	N22ORN17	144D	BIT 6 FLAG 9	
R0254	NEEDLFLG	006D	BIT 9 FLAG 0	
R0255	NEWIFLG	122D	BIT 13 FLAG 8	

L ERASABLE ASSIGNMENTS

R0256	NJETSFLG	015D	BIT 15 FLAG 1	
R0256	NODOFLAG	044D	BIT 1 FLAG 2	
R0259	NORMHOR	004D	BIT 11 FLAG 0	
R0260	NORMSW	110D	BIT 10 FLAG 7	
R0261	NOSWITCH	098D	BIT 7 FLAG 6	
R0265	NRMIDFLG	062D	BIT 13 FLAG 4	
R0266	NRMNVFLG	067D	BIT 6 FLAG 4	
R0267	NRUPTFLG	071D	BIT 4 FLAG 4	
R0268	NTARGFLG	102D	BIT 3 FLAG 6	
R0269	NWAITFLG	065D	BIT 10 FLAG 4	
R0272	OPTNSW	038D	BIT 7 FLAG 2	ETPIFLAG FIRSTFLG
R0274	ORBWFLAG	054D	BIT 6 FLAG 3	
R0275	ORDERSW	129D	BIT 6 FLAG 6	
R02765	P22MKFLG	49D	BIT 11 FLAG 3	
R0276	P39/79SW	126D	BIT 9 FLAG 6	
R0279	PDSPFLAG	063D	BIT 12 FLAG 4	
R0280	PFRATFLG	041D	BIT 4 FLAG 2	
R0281	PINBRFLG	069D	BIT 6 FLAG 4	
R0282	PRECIFLG	052D	BIT 6 FLAG 3	
R0283	PRFTRKAT	060D	BIT 10 FLAG 5	
R0284	PRIODFLG	061D	BIT 14 FLAG 4	
R0285	PRONVFLG	068D	BIT 7 FLAG 4	
R0286	QUITFLAG	145D	BIT 5 FLAG 9	
R0287	R21MARK	031D	BIT 14 FLAG 2	
R0288	R22CAFLG	143D	BIT 7 FLAG 9	
R0290	R23FLG	021D	BIT 9 FLAG 1	
R0291	R31FLAG	146D	BIT 4 FLAG 9	
R0293	R53FLAG	009D	BIT 6 FLAG 0	
R0294	R57FLAG	097D	BIT 8 FLAG 6	KNOWNFLG EGSW
R0296	R60FLAG	066D	BIT 4 FLAG 5	
R0297	REFSMFLG	047D	BIT 13 FLAG 3	
R02971	REINTFLG	158D	BIT 7 FLAG 10	
R0296	RELVELSW	096D	BIT 9 FLAG 6	
R0299	RENDWFLG	069D	BIT 1 FLAG 5	
R0300	RNDVZFLG	008D	BIT 7 FLAG 0	
R0304	RPQFLAG	120D	BIT 15 FLAG 6	
R0306	RVSW	111D	BIT 9 FLAG 7	
R0313	SAVECFLG	140D	BIT 10 FLAG 9	
R0314	SLOPESW	027D	BIT 3 FLAG 1	
R0315	SOLNSW	067D	BIT 3 FLAG 5	
R0316	SOURCFLG	142D	BIT 6 FLAG 9	
R0316	STATEFLG	055D	BIT 5 FLAG 3	
R0319	STEERSW	034D	BIT 11 FLAG 2	
R0320	STIKFLAG	016D	BIT 14 FLAG 1	
R03201	STRULLSW	92D	BIT 13 FLAG 6	
R0321	SURFFLAG	127D	BIT 6 FLAG 8	
R0323	SWTOVER	135D	BIT 15 FLAG 9	
R0324	TARG1FLG	020D	BIT 10 FLAG 1	
R0325	TARG2FLG	021D	BIT 9 FLAG 1	
R0326	TERMIFLG	105D	BIT 15 FLAG 7	

R0327	TPFSW	119D	BIT 1 FLAG 7
R0328	TIMRFLAG	109D	BIT 11 FLAG 7
R0329	TRACKFLG	025D	BIT 5 FLAG 1
R03295	TRM03FLG	28D	BIT 4 FLAG 1
R0330	TRUNFLAG	011D	BIT 4 FLAG 0
R0332	UPDATFLG	023D	BIT 7 FLAG 1
R0334	UPLOCKFL	116D	BIT 4 FLAG 7
R0335	V37FLAG	114D	BIT 6 FLAG 7
R0336	V59FLAG	078D	BIT 12 FLAG 5
R03361	V67FLAG	136D	BIT 14 FLAG 9
R03362	V82EMFLG	137D	BIT 13 FLAG 9
R0337	V94FLAG	139D	BIT 11 FLAG 9
R0338	VEHUPFLG	022D	BIT 8 FLAG 1
R0339	VERIFLAG	117D	BIT 3 FLAG 7
R0340	VFLAG	050D	BIT 10 FLAG 3
R0341	VHFRFLAG	141D	BIT 9 FLAG 9
R0343	VINTFLAG	057D	BIT 3 FLAG 3
R0344	XDELVFLG	037D	BIT 8 FLAG 2
R0345	XDSPFLAG	074D	BIT 1 FLAG 4

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P0352 INTERPRETIVE SWITCH BIT ASSIGNMENTS

0353	REF 1	0074	FLAGWRD0 =	STATE +0	(000-014)		
A0354					(SET)	(RESET)	
A0355							
0356				BIT 15 FLAG 0			
A0357		0000	CPHIFLAG =	000D	OUTPUT OF CALCGA IS CPHIX	OUTPUT OF CALCGA IS THETAD	
03575	REF 1	4674	CPHIBIT =	BIT15			
A0358							
0359				BIT 14 FLAG 0			
A0360		0001	JSWITCH =	001D	INTEGRATION OF W MATRIX	INTEGRATION OF STATE VECTOR	
03605	REF 1	4675	JSWCHBIT =	BIT14			
A0361							
0362				BIT 13 FLAG 0			
A0363		0002	MIDFLAG =	002D	INTEGRATION WITH SOLAR PERTURBATIONS	INTEGRATION WITHOUT SOLAR PERTURBATIONS	
03635	REF 1	4676	MIDFLBIT =	BIT13			
A0364							
0365				BIT 12 FLAG 0			
A0366		0003	MOONFLAG =	003D	MOON IS SPHERE OF INFLUENCE	EARTH IS SPHERE OF INFLUENCE	
03665	REF 1	4677	MOONBIT =	BIT12			
A0369							
0370				BIT 11 FLAG 0			
03705	REF 1	0004	NORFHOR =	004D	FAR HORIZON	NEAR HORIZON	
		4700	NORFBIT =	BIT11			
A0373							
0374				BIT 10 FLAG 0			
A0375		0005	ZMEASURE =	005D	MEASUREMENT PLANET AND PRIMARY PLANET DIFFERENT	MEASUREMENT PLANET AND PRIMARY PLANET SAME	
A0376							
03775	REF 1	4701	ZMEASBIT =	BIT10			
A0379							
0380				BIT 9 FLAG 0			
A0381		0006	NEEDLFLG =	006D	TOTAL ATTITUDE ERROR DISPLAYED	A/P FOLLOWING ERROR DISPLAYED	
03815	REF 1	4702	NEEDLBIT =	BIT9			
A0382							
0383				BIT 8 FLAG 0			
		0007	IMUSE =	007D	IMU IN USE	IMU NOT IN USE	

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03835	REF	1		4703	IMUSEBIT =	BIT8			
A0384						BIT 7 FLAG 0			
0385				0010	RNDVZFLG =	008D	P20 RUNNING	P20 NOT RUNNING	
03865	REF	1		4704	RNDVZBIT =	BIT7			
A0390						BIT 6 FLAG 0			
0391				0011	R53FLAG =	009D	V51 INITIATED	V51 NOT INITIATED	
03915	REF	1		4705	R53FLBIT =	BIT6			
A0395						BIT 5 FLAG 0			
0396				0012	P2RTE =	010D	IN TIME CRITICAL MODE	NOT IN TIME CRITICAL MODE	
A0397									
03975	REF	1		4706	P2RTEBIT =	BIT5			
A0398						BIT 4 FLAG 0			
0399				0013	TRUNFLAG =	011D	DRIVING OF TRUNNION ALLOWED	DRIVING OF TRUNNION NOT ALLOWED	
A0400									
04005	REF	1		4707	TRUNBIT =	BIT4			
A0403						BIT 3 FLAG 0			
0404				0014	FREEFLAG =	012D	(TEMPORARY FLAG USED IN MANY ROUTINES)		
04045	REF	1		4710	FREEFBIT =	BIT3			
A0405						BIT 2 FLAG 0			
A0406					=	013D			
A0408						BIT 1 FLAG 0			
0409				0016	KFLAG =	014D	SEARCH SECTOR MORE THAN 180 DEGREES	SEARCH SECTOR LESS THAN 180 DEGREES	
A0410									
04105	REF	1		4712	KBIT =	BIT1			
0411	REF	2	LAST 44	0075	FLAGWRD1 =	STATE +1	(015-029)		
A0412							(SET)	(RESET)	
A0413						BIT 15 FLAG 1			
0414				0017	NJETSFLG =	015D	TWO JET RCS BURN	FOUR JET RCS BURN	
04145	REF	2	LAST 44	4674	NJETSBIT =	BIT15			
A0415						BIT 14 FLAG 1			
0416				0020	STIKFLAG =	016D	RHC CONTROL	CMC CONTROL	

04185 REF 2 LAST 44 4875 STIKBIT = BIT14

A0417
0418 0021 ERADFLAG = BIT 13 FLAG 1 017D EARTH, COMPUTE FISCHER ELLIPSOID RADIUS EARTH, USE FIXED RADIUS
A0419
A04191
A04192
A04193 MOON, USE FIXED RADIUS MOON, USE RLS FOR LUNAR RADIUS
04195 REF 2 LAST 44 4878 ERADFBIT = BIT13

A0420
A0421 = BIT 12 FLAG 1 018D
A0422
0423 0023 ENG2FLAG = BIT 11 FLAG 1 019D RCS BURN SPS BURN

04235 REF 2 LAST 44 4700 ENG2BIT = BIT11

A0427
0428 0024 TARG1FLG = BIT 10 FLAG 1 020D SIGHTING LEM NOT SIGHTING LEM

04285 REF 2 LAST 44 4701 TARG1BIT = BIT10

A0429
0430 0025 TARG2FLG = BIT 9 FLAG 1 021D SIGHTING LANDMARK SIGHTING STAR

04305 REF 2 LAST 44 4702 TARG2BIT = BIT9

A0431
0432 0025 R23FLG = BIT 9 FLAG 1 021D R23 MARKING R21 MARKING
A0433

04335 REF 3 LAST 48 4702 R23BIT = BIT9

A0434
0435 0026 VEHUPFLG = BIT 8 FLAG 1 022D CSM STATE VECTOR BEING UPDATED LEM STATE VECTOR BEING UPDATED
A0438

04365 REF 2 LAST 45 4703 VEHUPBIT = BIT8

A0437
0438 0027 UPDATFLG = BIT 7 FLAG 1 023D UPDATING BY MARKS ALLOWED UPDATING BY MARKS NOT ALLOWED
A0439

04395 REF 2 LAST 45 4704 UPDATBIT = BIT7

A0440 BIT 6 FLAG 1

04411					0030	IDLEFAIL =	024D		INHIBIT R41	ENABLE R41 (ENGFAIL)
04415	REF	2	LAST	45	4705	IDLEBIT =	BIT8			
A0442							BIT 5 FLAG 1			
0443					0031	TRACKFLG =	025D		TRACKING ALLOWED	TRACKING NOT ALLOWED
04435	REF	2	LAST	45	4706	TRACKBIT =	BIT5			
A0444							BIT 4 FLAG 1			
0445					0032	TRM03FLG =	26D		REQUEST TO	NO REQUEST TO
0446	REF	2	LAST	45	4707	TRM03BIT =	BIT4		TERMINATE P03 HAS BEEN ENTERED	TERMINATE P03 HAS BEEN ENTERED
A0447										
A0450							BIT 3 FLAG 1			
0451					0033	SLOPESW =	27D		ITERATE WITH BIAS METHOD IN ITERATOR	ITERATE WITH REGULA FALSI METHOD IN ITERATOR
A0452										
A04521										
04525	REF	2	LAST	45	4710	SLOPEBIT =	BIT3			
A0456							BIT 2 FLAG 1			
0457					0034	GUESSW =	028D		NO STARTING VALUE FOR ITERATION	STARTING VALUE FOR ITERATION EXISTS
A0458										
04565	REF	1			4711	GUESSBIT =	BIT2			
A0459							BIT 1 FLAG 1			
0460					0035	AVEGFLAG =	029D		AVERAGEG (SERVICER) TO CONTINUE	AVERAGEG (SERVICER) TO CEASE
A0461										
04615	REF	2	LAST	45	4712	AVEGBIT =	BIT1			
0462	REF	3	LAST	45	0076	FLAGWRD2 =	STATE +2		(030-044)	
A0463									(SET)	(RESET)
A0464							BIT 15 FLAG 2			
0465					0036	DRIFTFLG =	030D		T3RUPT CALLS GYRO COMPENSATION	T3RUPT DOES NO GYRO COMPENSATION
A0466										
04665	REF	3	LAST	45	4674	DRFTBIT =	BIT15			
A0470							BIT 14 FLAG 2			
0471					0037	R21MARK =	031D		OPTION ONE FOR MARKRUPT	OPTION TWO FOR MARKRUPT
A0472										
04725	REF	3	LAST	46	4675	R21BIT =	BIT14			

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A0476									
0477					0040	22DSPFLG =	BIT 13 FLAG 2		
04775	REF	3	LAST	46	4676	22DSPBIT =	032D BIT13	DISPLAY DR,DV	DO NOT DISPLAY DR,DV
A0478									
A0479							BIT 12 FLAG 2		
A0480						=	033D		
A0481									
0482					0042	STEERSW =	BIT 11 FLAG 2 034D	STEERING TO BE DONE	STEERING OMITTED
04825	REF	3	LAST	46	4700	STEERBIT =	BIT11		
A0483									
0484					0043	CYCLESW =	BIT 10 FLAG 2 035D	VG CALCULATION TO BE DONE	VG CALCULATION OMITTED
A0485									
04855	REF	3	LAST	46	4701	CYCLEBIT =	BIT10		
A0486									
0487					0044	IMPULSW =	BIT 9 FLAG 2 038D	MINIMUM IMPULSE BURN (CUTOFF TIME SPECIFIED)	STEERING BURN (NO CUTOFF TIME YET AVAILABLE)
A0488									
A0489									
04895	REF	4	LAST	46	4702	IMPULBIT =	BIT9		
A0490									
0491					0045	XDELVFLG =	BIT 8 FLAG 2 037D	EXTERNAL DELTAV VG COMPUTATION	LAMBERT (AIMPOINT) VG COMPUTATION
A0492									
04925	REF	3	LAST	46	4704	XDELVBIT =	BIT7		
A0493									
0494					0046	ETPIFLAG =	BIT 7 FLAG 2 038D	ELEVATION ANGLE SUPPLIED FOR P34,74	TPI TIME SUPPLIED FOR P34,74
A0495									
A0496									
0497	REF	1			0046	FIRSTFLG =	BIT 7 FLAG 2 ETPIFLAG	SUCCEEDING PASS THRU S40.9	FIRST PASS THRU S40.9
A0498									
04985	REF	4	LAST	48	4704	FIRSTBIT =	BIT7		
A0501									
0502	REF	2	LAST	48	0046	OPTNSW =	BIT 7 FLAG 2 ETPIFLAG	SOI PHASE P38/P78	SOR PHASE OF P38/P78
05025	REF	3	LAST	47	4705	FINALBIT =	BIT6		
A0503							BIT 6 FLAG 2		

0504					0047	FINALFLG =	039D		LSAT PASS THROUGH RENDEZVOUS PROGRAM COMPUTATIONS	INTERIM PASS THROUGH RENDEZVOUS PROGRAM COMPUTATIONS
A0505										
A0506										
05085	REF	3	LAST	47	4706	AVFLBIT =	BIT5			
A0507							BIT 5 FLAG 2			
0508					0050	AVFLAG =	040D		LEM IS ACTIVE VEHICLE	CSM IS ACTIVE VEHICLE
A0509										
A0510							BIT 4 FLAG 2			
0511					0051	PFRATFLG =	041D		PREFERRED ATTITUDE COMPUTED	PREFERRED ATTITUDE NOT COMPUTED
A0512										
05125	REF	3	LAST	47	4707	PFRATBIT =	BIT4			
A0513							BIT 3 FLAG 2			
0514					0052	CALCMAN3 =	042D		NO FINAL ROLL	FINAL ROLL IS NECESSARY
A0515										
05155	REF	3	LAST	47	4710	CALC3BIT =	BIT3			
A0516							BIT 2 FLAG 2			
0517					0053	CALCMAN2 =	043D		PERFORM MANEUVER STARTING PROCEDURE	BYPASS STARTING PROCEDURE
A0518										
05185	REF	2	LAST	47	4711	CALC2BIT =	BIT2			
A0519							BIT 1 FLAG 2			
0520					0054	NODOFLAG =	044D		V37 NOT PERMITTED	V37 PERMITTED
05205	REF	3	LAST	47	4712	NODOBIT =	BIT1			
0521	REF	4	LAST	47	0077	FLAGWRD3 =	STATE +3		(045-059)	
A0522									(SET)	(RESET)
A0523							BIT 15 FLAG 3			
A0524						=	045D			
A0525										
A0526							BIT 14 FLAG 3			
0527					0056	GLOKFAIL =	046D		GIMBAL LOCK HAS OCCURED	NOT IN GIMBAL LOCK
A0528										
05285	REF	4	LAST	47	4675	GLOKFBIT =	BIT14			
A0529							BIT 13 FLAG 3			
0530					0057	REFSMFLG =	047D		REFSMMAT GOOD	REFSMMAT NO GOOD

05305 REF 4 LAST 48 4676 REFSMBIT = BIT13

A0531

0532 0060 LUNAFLAG = BIT 12 FLAG 3 048D LUNAR LAT-LONG EARTH LAT-LONG

05325 REF 2 LAST 44 4677 LUNABIT = BIT12

A0533

0534 0061 P22MKFLG = BIT 11 FLAG 3 49D P22 DOWNLINKED MARK DATA WAS JUST TAKEN P22 DOWLINK MARK DATA NOT JUST TAKEN

A0535

05355 REF 4 LAST 48 4700 P22MKBIT = BIT11

A0537

0538 0062 VFLAG = BIT 10 FLAG 3 050D LESS THAN TWO STARS IN FIELD OF VIEW TWO STARS IN FIELD OF VIEW

A0539

05395 REF 4 LAST 48 4701 VFLAGBIT = BIT10

A0540

A0541 = BIT 9 FLAG 3 051D

A0542

0543 0064 PRECIFLG = BIT 8 FLAG 3 052D CSMPREC OR LEMPREC CALLED INTEGRV OR INTEGRVS CALLED

A0544

05445 REF 3 LAST 46 4703 PRECIBIT = BIT8

A0545

0546 0065 CULTFLAG = BIT 7 FLAG 3 053D STAR OCCULTED STAR NOT OCCULTED

05465 REF 5 LAST 48 4704 CULTBIT = BIT7

A0547

0548 0066 ORBWFLAG = BIT 6 FLAG 3 054D W MATRIX VALID FOR ORBITAL NAVIGATION W MATRIX INVALID FOR ORBITAL NAVIGATION

A0549

05495 REF 4 LAST 48 4705 ORBWFBIT = BIT6

A0550

0551 0067 STATEFLG = BIT 5 FLAG 3 055D PERMANENT STATE VECTOR UPDATED PERMANENT STATE VECTOR NOT UPDATED

A0552

05525 REF 4 LAST 49 4706 STATEBIT = BIT5

A0553

0554 0070 INTYPFLG = BIT 4 FLAG 3 056D CONIC INTEGRATION ENCKE INTEGRATION

05545 REF 4 LAST 49 4707 INTYBIT = BIT4

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A0555 0556 A0557					0071	VINTFLAG =	BIT 3 FLAG 3 057D	CSM STATE VECTOR BEING INTEGRATED	LEM STATE VECTOR BEING INTEGRATED
05575	REF	4	LAST	49	4710	VINTFBIT =	BIT3		
A0558 0559 A0560					0072	D8OR9FLG =	BIT 2 FLAG 3 058D	DIMENSION OF W IS 9 FOR INTEGRATION	DIMENSION OF W IS 6 FOR INTEGRATION
05605	REF	3	LAST	49	4711	D8OR9BIT =	BIT2		
A0561 0562 A0563					0073	DIM0FLAG =	BIT 1 FLAG 3 059D	W MATRIX IS TO BE USED	W MATRIX IS NOT TO BE USED
0564	REF	5	LAST	49	0100	FLAGWRD4 =	STATE +4	(060-074)	
A0565								(SET)	(RESET)
05655	REF	4	LAST	49	4712	DIM0BIT =	BIT1		
A0566 0567 A0568					0074	MRKIDFLG =	BIT 15 FLAG 4 060D	MARK DISPLAY IN ENDIDLE	NO MARK DISPLAY IN ENDIDLE
05685	REF	4	LAST	47	4674	MRKIDBIT =	BIT15		
A0569 0570 A0571					0075	PRIODFLG =	BIT 14 FLAG 4 061D	PRIORITY DISPLAY IN ENDIDLE	NO PRIORITY DISPLAY IN ENDIDLE
05715	REF	5	LAST	49	4675	PRIODBIT =	BIT14		
A0572 0573 A0574					0076	NRMIDFLG =	BIT 13 FLAG 4 062D	NORMAL DISPLAY IN ENDIDLE	NO NORMAL DISPLAY IN ENDIDLE
05745	REF	5	LAST	50	4676	NRMIDBIT =	BIT13		
A0575 0576 A0577					0077	PDSPFLAG =	BIT 12 FLAG 4 063D	CAN=T INTERRUPT PRIORITY DISPLAY	SEE M. HAMILTON
05775	REF	3	LAST	50	4677	PDSPFBIT =	BIT12		
A0578 0579 A0580 A0581					0100	MWAITFLG =	BIT 11 FLAG 4 064D	HIGHER PRIORITY DISPLAY OPERATING WHEN MARK DISPLAY	NO HIGHER PRIORITY DISPLAY OPERATING WHEN MARK DISPLAY

A0562

						INITIATED	INITIATED
05825	REF 5	LAST 50	4700	NWAITBIT =	BIT11		
A0563							
0564			0101	NWAITFLG =	BIT 10 FLAG 4 065D		
A0565						HIGHER PRIORITY DISPLAY OPERATING WHEN NORMAL DISPLAY INITIATED	NO HIGHER PRIORITY DISPLAY OPERATING WHEN NORMAL DISPLAY INITIATED
A0566							
A0567							
05875	REF 5	LAST 50	4701	NWAITBIT =	BIT10		
A0568							
0569			0102	MRKNVFLG =	BIT 9 FLAG 4 066D		
A0590						ASTRONAUT USING KEYBOARD WHEN MARK DISPLAY INITIATED	ASTRONAUT NOT USING KEYBOARD WHEN MARK DISPLAY INITIATED
A0591							
05915	REF 5	LAST 48	4702	MRKNVBIT =	BIT9		
A0592							
0593			0103	NRMNVFLG =	BIT 8 FLAG 4 067D		
A0594						ASTRONAUT USING KEYBOARD WHEN NORMAL DISPLAY INITIATED	ASTRONAUT NOT USING KEYBOARD WHEN NORMAL DISPLAY INITIATED
A0595							
A0596							
05965	REF 4	LAST 50	4703	NRMNVBIT =	BIT8		
A0597							
0598			0104	PRONVFLG =	BIT 7 FLAG 4 068D		
A0599						ASTRONAUT USING KEYBOARD WHEN PRIORITY DISPLAY INITIATED	ASTRONAUT NOT USING KEYBOARD WHEN PRIORITY DISPLAY INITIATED
A0600							
A0601							
06015	REF 6	LAST 50	4704	PRONVBIT =	BIT7		
A0602							
0603			0105	PINBRFLG =	BIT 6 FLAG 4 069D		
A0604						ASTRONAUT HAS INTERFERED WITH EXISTING DISPLAY	ASTRONAUT HAS NOT INTERFERED WITH EXISTING DISPLAY
A0605							
06055	REF 5	LAST 50	4705	PINBRBIT =	BIT6		
A0606							
0607			0106	MRUPTFLG =	BIT 5 FLAG 4 070D		
A0608						MARK DISPLAY INTERRUPTED BY PRIORITY DISPLAY	MARK DISPLAY NOT INTERRUPTED BY PRIORITY DISPLAY
A0609							
06095	REF 5	LAST 50	4706	MRUPTBIT =	BIT5		
A0610					BIT 4 FLAG 4		

0611					0107	NRUPTFLG =	071D	NORMAL DISPLAY INTERRUPTED BY PRIORITY OR MARK DISPLAY	NORMAL DISPLAY NOT INTERRUPTED BY PRIORITY OR MARK DISPLAY
A0612									
A0613									
A0614									
06145	REF	5	LAST	50	4707	NRUPTBIT =	BIT4		
A0615							BIT 3 FLAG 4		
0616					0110	MKOVFLAG =	072D	MARK DISPLAY OVER NORMAL	NO MARK DISPLAY OVER NORMAL
A0617									
06175	REF	5	LAST	51	4710	MKOVBIT =	BIT3		
A06179							BIT 2 FLAG 4	DISPLAY BIT	
A0618						=	073D	CLEARED AT INTERVALS	
A0619									
A0620							BIT 1 FLAG 4	MARK DISPLAY NOT TO	NO SPECIAL MARK
0621					0112	XDSPFLAG =	074D	BE INTERRUPTED	INFORMATION.
06215	REF	5	LAST	51	4712	XDSPBIT =	BIT1		
0622	REF	6	LAST	51	0101	FLAGWRD5 =	STATE +5	(075-099)	
A0623								(SET)	(RESET)
A0624							BIT 15 FLAG 5		
0625					0113	DSKYFLAG =	075D	DISPLAYS SENT TO DSKY	NO DISPLAYS TO DSKY
A0626									
A06265									
062655	REF	5	LAST	51	4674	DSKYBIT =	BIT15		
A0627							BIT 14 FLAG 5		
A0628						=	76D		
A0630							BIT 13 FLAG 5		
A0631						=	77D		
A0637							BIT 12 FLAG 5		
0638					0116	V59FLAG =	078D	CALIBRATING FOR P 23	NORMAL MARKING FOR P 23
A0639									
06395	REF	4	LAST	51	4677	V59FLBIT =	BIT12		
A0640							BIT 11 FLAG 5		
0641					0117	INCORFLG =	079D	FIRST INCORPORATION	SECOND INCORPORATION
06415	REF	6	LAST	52	4700	INCORBIT =	BIT11		

A0642							
0643		0120	RNGSCFLG =	BIT 10 FLAG 5 80D			
A0646					ANOTHER TAG FOR PRPTKAT		
0647	REF 1	0120	PRPTRKAT =	BIT 10 FLAG 5 RNGSCFLG			
A0648					PREF TRACK ATT	+X AXIS TRACK ATT	
06485	REF 6 LAST 52	4701	PRPTRBIT =	BIT10			
A0649							
0650		0121	DMENFLG =	BIT 9 FLAG 5 081D			
A0651					DIMENSION OF W IS 9 FOR INCORPORATION	DIMENSION OF W IS 6 FOR INCORPORATION	
06515	REF 6 LAST 52	4702	DMENFBIT =	BIT9			
A0652							
0653		0122	COMPUTER =	BIT 6 FLAG 5 082D			
					COMPUTER IS CMC	COMPUTER IS LGC	
06535	REF 5 LAST 52	4703	COMPTBIT =	BIT8			
A0654							
0655		0123	ENGONFLG =	BIT 7 FLAG 5 063D			
					ENGINE TURNED ON	ENGINE TURNED OFF	
06555	REF 7 LAST 52	4704	ENGONBIT =	BIT7			
A0656							
0657		0124	3AXISFLG =	BIT 6 FLAG 5 084D			
A0658					MANEUVER SPECIFIED BY THREE AXES	MANEUVER SPECIFIED BY ONE AXIS	
06565	REF 6 LAST 52	4705	3AXISBIT =	BIT6			
A0662							
0663		0125	GRRFKFLG =	BIT 5 FLAG 5 065D			
A0664					BACKUP GRR RECEIVED	BACKUP GRR NOT RECEIVED	
06645	REF 6 LAST 52	4706	GRRFKBIT =	BIT5			
A0665							
0666		0126	R60FLAG =	BIT 4 FLAG 5 066D			
A0667					R61 MUST USE R60	NORMAL R61	
06675	REF 6 LAST 53	4707	R60FLBIT =	BIT4			
A0672							
0673		0127	SOLNSW =	BIT 3 FLAG 5 87D			
A0674					LAMBERT DOES NOT CONVERGE, OR TIME-RADIUS NEARLY CIRC.	LAMBERT CONVERGES OR TIME-RADIUS NON CIRCULAR.	
A06741							

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 06745  REF  6  LAST  53     4710          SOLNSBIT =     BIT3

A0675                                                    BIT 2 FLAG 5
 0676                        0130          MGLVFLAG =     068D      LOCAL VERTICAL      MIDDLE GIMBAL ANGLE
A0677                                                                COORDINATES         COMPUTED
A0678                                                                COMPUTED

 06765  REF  4  LAST  51     4711          MGLVFBIT =     BIT2

A0679                                                    BIT 1 FLAG 5
 0680                        0131          RENDWFLG =     069D      W MATRIX VALID      W MATRIX INVALID
A0681                                                                FOR RENDEZVOUS      FOR RENDEZVOUS
A0682                                                                NAVIGATION          NAVIGATION

 06625  REF  6  LAST  53     4712          RENDWBIT =     BIT1

 0683   REF  7  LAST  53     0102          FLAGWRD6 =     STATE +6  (090-104)

A0684                                                                (SET)               (RESET)

A0687                                                    BIT 15 FLAG 6
 0686                        0132          DAPBIT1  =     090D      1 SATURN 1 TVC      0 RCS    0 NO
 06665  REF  6  LAST  53     4674          DAP1BIT  =     BIT15

A0689                                                    BIT 14 FLAG 6
 0690                        0133          DAPBIT2  =     091D      1 A/P    0 A/P      1 A/P    0 A/P

 06905  REF  6  LAST  51     4675          DAP2BIT  =     BIT14

A0694                                                    BIT 13 FLAG 6
 0695                        0134          STRULLSW =     92D       DO STEERULL         DO ULAGEOFF ONLY
A0696
 06965  REF  6  LAST  51     4676          STRULBIT =     BIT13

A0697                                                    BIT 13 FLAG 6
 0698   REF  1               0134          ENTRYDSP =     STRULLSW  DO ENTRY DISPLAY    OMIT ENTRY DISPLAY
A0699                                                                VIA ENTRYVN.

 06995  REF  7  LAST  55     4676          ENDSPBIT =     BIT13

A0706                                                    BIT 12 FLAG 6
 0707                        0135          CMDAPARM =     093D      ALOW ENTRY FIRINGS  INHIBIT ENTRY FIRING
A0708                                                                AND CALCULATIONS    AND CONTROL FUNCTION

 07065  REF  5  LAST  53     4677          CMARMBIT =     BIT12

A0709                                                    BIT 11 FLAG 6
 0710                        0136          GAMDIFSW =     094D      CALCULATE GAMDOT    GAMDOT NOT TO BE
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A0711								CALCULATED
	07115	REF 7	LAST 53	4700	GMDIFBIT =	BIT11		
A0712								
	0713			0137	GMBDRVSW =	BIT 10 FLAG 6 095D	TRIMGIMB OVER	TRIMGIMB NOT OVER
	07135	REF 7	LAST 54	4701	GMBDRBIT =	BIT10		
A0714								
	0715	REF 1		0137	GONEPAST =	BIT 10 FLAG 6 GMBDRVSW	LATERAL CONTROL CALCULATIONS TO BE OMITTED	LATERAL CONTROL CALCULATIONS TO BE DONE
A0716								
A0717								
	07175	REF 6	LAST 56	4701	GONEBIT =	BIT10		
A0716								
	0719			0140	RELVELSW =	BIT 9 FLAG 6 096D	TARGETING USES EARTH-RELATIVE VELOCITY	TARGETING USES INERTIAL VELOCITY
A0720								
A0721								
	07215	REF 7	LAST 54	4702	RELVBIT =	BIT9		
A0724								
	0725			0141	EGSW =	BIT 8 FLAG 6 097D	IN FINAL PHASE	NOT IN FINAL PHASE
	07255	REF 6	LAST 54	4703	EGFLGBIT =	BIT8		
A0726								
	0727	REF 1		0141	KNOWNFLG =	BIT 8 FLAG 6 EGSW	LANDMARK KNOWN	LANDMARK UNKNOWN
	07275	REF 7	LAST 56	4703	KNOWNBIT =	BIT8		
A0728								
	0729	REF 1		0141	R57FLAG =	BIT 6 FLAG 6 KNOWNFLG	DO NOT DO R57 TRUNION BIAS HAS BEEN OBTAINED.	DO R57, TRUNION BIAS NEEDED
A0730								
A0731								
	07315	REF 8	LAST 56	4703	R57BIT =	BIT8		
A0735								
	0736			0142	NOSWITCH =	BIT 7 FLAG 6 098D	LATERAL ROLL MANUVER INHIBITED IN ENTRY	LATERAL ROLL MANUVER PERMITED IN ENTRY
	0737	REF 6	LAST 54	4704	NOSWBIT =	BIT7		
A07375								
A0740								
	0741			0143	HIND =	BIT 6 FLAG 6 099D	ITERATING HUNTEST CALCULATIONS TO BE DONE AFTER RANGE	ITERATING OF HUNTEST CALCULATIONS TO BE OMITTED AFTER RANGE
A0742								
A0743								

A0744									PREDICTION	PREDICTION
07445	REF	7	LAST	54	4705	HINDBIT	=	BIT6		
A0748								BIT 5 FLAG 6		
0749					0144	INRLSW	=	100^D	INITIAL ROLL V(LV)	INITIAL ROLL V(LV)
A0750										
07505	REF	7	LAST	54	4706	INRLBIT	=	BIT5		
A0751									ATTITUDE NOT HELD	ATTITUDE HELD
A0754								BIT 4 FLAG 6		
0755					0145	LATSW	=	101^D	DOWNLIFT NOT INHIBITED	DOWNLIFT INHIBITED
A0756										
07565	REF	7	LAST	54	4707	LATSWBIT	=	BIT4		
A0759								BIT 3 FLAG 6		
0760					0146	.05GSW	=	102^D	DRAG OVER .05G	DRAG LESS THAN .05G
07605	REF	7	LAST	55	4710	.05GBIT	=	BIT3		
A0761								BIT 3 FLAG 6		
0762					0146	NTARGFLG	=	102^D	ASTRONAUT DID OVERWRITE DELTA	ASTRONAUT DID NOT OVERWRITE DELTA
A0763										
07635	REF	8	LAST	57	4710	NTARGBIT	=	BIT3		
A0764								BIT 2 FLAG 6		
0765					0147	CM/DSIBY	=	103^D	ENTRY DAP ACTIVATED	ENTRY DAP NOT ACTIVATED
A0766										
07665	REF	5	LAST	55	4711	CM/DSBIT	=	BIT2		
A0769								BIT 1 FLAG 6		
0770					0150	GYMDIFSW	=	104^D	CDU DIFFERENCES AND BODY RATES COMPUTED	CDU DIFFERENCES AND BODY RATES NOT COMPUTED
A0775										
A0776										
07765	REF	7	LAST	55	4712	GYMDIBIT	=	BIT1		
0777	REF	8	LAST	55	0103	FLAGWRD7	=	STATE +7	(105-119)	
A0778									(SET)	(RESET)
A0779								BIT 15 FLAG 7		
0760					0151	TERMIFLG	=	105^D	TERMINATE R21,R22	DO NOT TERMINATE R21,R22
A0781										
07615	REF	7	LAST	55	4674	TERMIBIT	=	BIT15		

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A0768 0767 A0766			0152	ITSWICH =	BIT 14 FLAG 7 106D	ACCEPT NEXT LAMBERT TEST LAMBERT ANSWER TPI SEARCH SOLUTION AGAINST LIMITS		
07865	REF 7 LAST 55		4875	ITSWBIT =	BIT14			
A0789 0790			0153	IGNFLAG =	BIT 13 FLAG 7 107D	TIG HAS ARRIVED	TIG HAS NOT ARRIVED	
07905	REF 6 LAST 55		4676	IGNFLBIT =	BIT13			
A0791 0792 A0793			0154	ASTNFLAG =	BIT 12 FLAG 7 108D	ASTRONAUT HAS OKAYED IGNITION	ASTRONAUT HAS NOT OKAYED IGNITION	
07935	REF 8 LAST 55		4677	ASTNBIT =	BIT12			
A0794 0795			0155	TIMRFLAG =	BIT 11 FLAG 7 109D	CLOCKTASK OPERATING	CLOCKTASK INOPERATIVE	
07955	REF 6 LAST 56		4700	TIMRBIT =	BIT11			
A0799 0600 A0801			0156	NORMSW =	BIT 10 FLAG 7 110D	UNIT NORMAL INPUT TO LAMBERT.	LAMBERT COMPUTE ITS OWN UNIT NORMAL.	
06015	REF 9 LAST 58		4701	NORMSBIT =	BIT10			
A0606 0807 A08071 A08075			0157	RVSW =	BIT 9 FLAG 7 111D	DO NOT COMPUTE FINAL STATE VECTOR IN TIME-THETA.	COMPUTE FINAL STATE VECTOR IN TIME-THETA	
080755	REF 8 LAST 56		4702	RVSWBIT =	BIT9			
A0608 0809			0180	GONEBY =	BIT 8 FLAG 7 112D	PASSED TARGET	APPROACHING TARGET	
08095	REF 9 LAST 56		4703	GONBYBIT =	BIT8			
A0610 0811			0161	IDLEFLAG =	BIT 7 FLAG 7 113D	NO DV MONITOR	CONNECT DV MONITOR	
06115	REF 9 LAST 56		4704	IDLEFBIT =	BIT7			
A0612 0613 A0614			0182	V37FLAG =	BIT 6 FLAG 7 114D	AVERAGEG (SERVICER) RUNNING	AVERAGEG (SERVICER) OFF	

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```
 06145  REF  8  LAST  57    4705          V37FLBIT =     BIT8

A0815                                                   BIT 5 FLAG 7
A0816                                          =        115D
A0817                                          =        BIT5
A0818

A0819                                                   BIT 4 FLAG 7
 0820                        0164          UPLOCKFL =     116D          K-KBAR-K FAIL          NO K-KBAR-K FAIL

 06205  REF  8  LAST  57    4707          UPLOCBIT =     BIT4

A0821                                                   BIT 3 FLAG 7
 0822                        0165          VERIFLAG =     117D          CHANGED WHEN V33E OCCURS AT END OF P27

 06225  REF  9  LAST  57    4710          VERIFBIT =     BIT3

A0823                                                   BIT 2 FLAG 7
 0824                        0166          ATTCHFLG =     118D          LM,CM ATTACHED         LM,CM NOT ATTACHED

 06245  REF  8  LAST  57    4711          ATTCHBIT =     BIT2

A0825                                                   BIT 1 FLAG 7
 0826                        0167          TPFSW    =     119D          CALCULATE TPERIGEE     CALCULATE TPF

 06265  REF  8  LAST  57    4712          TPFSWBIT =     BIT1

 0827   REF  9  LAST  57    0104          FLAGWRD8 =     STATE +8D     (120-134)

A0828                                                                  (SET)                  (RESET)

A0829                                                   BIT 15 FLAG 8
 0830                        0170          RPQFLAG  =     120D          RPQ NOT COMPUTED       RPQ COMPUTED

 06305  REF  8  LAST  57    4674          RPQFLBIT =     BIT15

A0831                                                   BIT 14 FLAG 8
A0832                                          =        121D
A0833

A0834                                                   BIT 13 FLAG 8
 0835                        0172          NEWIFLG  =     122D          FIRST PASS THROUGH     SUCCEEDING ITERATION
A0836                                                                  INTEGRATION            OF INTEGRATION

 06365  REF  9  LAST  58    4676          NEWIBIT  =     BIT13

A0837                                                   BIT 12 FLAG 8
 0838                        0173          CMOONFLG =     123D          PERMANENT CSM STATE    PERMANENT CSM STATE
 0839   REF  7  LAST  58    4677          CMOONBIT =     BIT12         IN LUNAR SPHERE        IN EARTH SPHERE
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A0840						
0841					BIT 11 FLAG 8	
0842	REP 9 LAST 58	0174	LMOONFLG =	124D	PERMANENT LM STATE IN LUNAR SPHERE	PERMANENT LM STATE IN EARTH SHPERE
		4700	LMOONBIT =	BIT11		
A0843						
0844				BIT 10 FLAG 8		
A0845		0175	ADVTRK =	125D	ADVANCE GROUND TRACK SIGHTING WANTED	NOT ADVANCED GROUND TRACK
08455	REP 10 LAST 58	4701	ADVTKBIT =	BIT10		
A0848						
0847				BIT 9 FLAG 8		
A0848		0178	P39/79SW =	128D	P39/79 OPERATING	P38/78 OPERATING
08485	REP 9 LAST 58	4702	P39SWBIT =	BIT9		
A0849						
0850				BIT 8 FLAG 8		
A0851		0177	SURFFLAG =	127D	LM ON LUNAR SURFACE	LM NOT ON LUNAR SURFACE
08515	REP 10 LAST 58	4703	SURFFBIT =	BIT8		
A0854						
0855				BIT 7 FLAG 8		
A0858		0200	INFINFLG =	128D	NO CONIC SOLUTION (CLOSURE THROUGH INFINITY REQUIRED).	CONIC SOLUTION EXISTS.
A08561						
08585	REP 10 LAST 58	4704	INFINBIT =	BIT7		
A0857						
0858				BIT 6 FLAG 8		
A08581		0201	ORDERSW =	129D	ITERATOR USES 2ND ORDER MINIMUM MODE.	ITERATOR USES 1ST ORDER STANDARD MODE.
08585	REP 9 LAST 59	4705	ORDERBIT =	BIT6		
A0859						
0880				BIT 5 FLAG 8		
A08805		0202	APSESW =	130D	RDESIRED OUTSIDE PERICENTER-APOCENTER RANGE IN TIME-RAD	RDESIRED INSIDE PERICENTER-APOCENTE RANGE IN TIME-RADIUS
A0881						
08815	REP 8 LAST 57	4708	APSESBIT =	BIT5		
A0862						
08825				BIT 4 FLAG 8		
A0883		0203	COGAFLAG =	131D	NO CONIC SOLUTION TOO CLOSE TO RECTILINEAR (COGA OVERFLOWS).	CONIC SOLUTION EXISTS (COGA DOES NOT OVERFLOW).
A08631						
A0864						

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 08645  REF   9  LAST  59     4707          COGAFBIT =     BIT4

A0865                                                     BIT 3 FLAG 8
A0868                                      =              132D
A0887

A0888                                                     BIT 2 FLAG 8
A0889                                      =              133D
A0870                                                     BIT 1 FLAG 8
 0871                      0208            380SW    =     134D          TRANSFER ANGLE NEAR  TRANSFER ANGLE NOT
A0872                                                                    380 DEGREES          NEAR 380 DEGREES

 08725  REF   9  LAST  59     4712          380SWBIT =     BIT1

 0873   REF  10  LAST  59     0105          FLAGWRD9 =     STATE +9D     (135 - 149)

A0874                                                                   (SET)                (RESET)
A0875                                                     BIT 15 FLAG 9
 0878                      0207            SWTOVER  =     135D          SWITCHOVER HAS       NO SWITCHOVER YET
A0877                                                                   OCCURRED

 08775  REF   9  LAST  59     4874          SWTOVBIT =     BIT15

A0878                                                     BIT 14 FLAG 9
 0879                      0210            V87FLAG  =     136D          ASTRONAUT OVERWRITES ASTRONAUT DOES NOT
A08795                                                                  W MATRIX INITIAL     OVERWRITE INITIAL
A08798                                                                  VALUES               VALUES

 087985 REF   8  LAST  58     4675          V87FLBIT =     BIT14

A0880                                                     BIT 13 FLAG 9
 0881                      0211            V82EMFLG =     137D          MOON VICINITY        EARTH VICINITY
A08815
 088155 REF  10  LAST  59     4676          V82EMBIT =     BIT13

A0882                                                     BIT 12 FLAG 9
 0883                      0212            MAXDBFLG =     138D          MAX DB SELECTED      MIN DB SELECTED
A0884

 08845  REF   8  LAST  59     4677          MAXDBBIT =     BIT12

A0885                                                     BIT 11 FLAG 9
 0888                      0213            V94FLAG  =     139D          V94 ALLOWED DURING   V94 NOT ALLOWED
A0887                                                                   P23

 08875  REF  10  LAST  80     4700          V94FLBIT =     BIT11
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A0888							
0889			0214	SAVECFLG =	BIT 10 FLAG 9 140D	P23 DISPLAY AND DATA STORAGE AFTER MARK IS DONE	P23 DISPLAY AND DATA STORAGE BEFORE MARK IS DONE
A0890							
A0891							
08915	REF 11	LAST 80	4701	SAVECBIT =	BIT10		
A0892							
0893			0215	VHPRFLAG =	BIT 9 FLAG 9 141D	ALLOW R22 TO ACCEPT RANGE DATA	STOP ACCEPTANCE OF RANGE DATA
A0894							
A0895							
08955	REF 10	LAST 60	4702	VHPRBIT =	BIT9		
A0898							
0897			0218	SOURCFLG =	BIT 8 FLAG 9 142D	SOURCE OF INPUT DATA IS FROM VHF RADAR	SOURCE OF INPUT DATA IS FROM OPTICS MARK
A0898							
A0899							
08995	REF 11	LAST 60	4703	SOURCBIT =	BIT8		
A0900							
0901			0217	R22CAFLG =	BIT 7 FLAG 9 143D	R-22 CALCULATIONS ARE GOING ON	R-22 CALCULATIONS ARE NOT GOING ON
A0902							
09025	REF 11	LAST 60	4704	R22CABIT =	BIT7		
A0903							
0904			0220	N22ORN17 =	BIT 6 FLAG 9 144D	COMPUTE TOTAL ATTITUDE ERRORS WRT N22 (V82)	COMPUTE TOTAL ATTITUDE ERRORS WRT N17 (V83)
A0905							
A0908							
09065	REF 10	LAST 60	4705	N2217BIT =	BIT6		
A0907							
0908			0221	QUITFLAG =	BIT 5 FLAG 9 145D		
09085	REF 9	LAST 60	4706	QUITBIT =	BIT5		
A0909							
0910			0222	R31FLAG =	BIT 4 FLAG 9 146D	R31 SELECTED (V83)	R34 SELECTED (V85)
09105	REF 10	LAST 81	4707	R31FLBIT =	BIT4		
A0911							
0912			0223	MID1FLAG =	BIT 3 FLAG 9 147D	INTEGRATE TO TDEC	INTEGRATE TO THE THEN-PRESENT TIME
A0913							
09135	REF 10	LAST 59	4710	MID1FBIT =	BIT3		

A0914									
0915					0224	MIDAVFLG =	BIT 2 FLAG 9 148D	INTEGRATION ENTERED FROM ONE OF MIDTOAV PORTALS	INTEGRATION WAS NOT ENTERED VIA MIDTOAV
A0916									
A0917									
09175	REF	7	LAST	59	4711	MIDAVBIT =	BIT2		
A0918									
0919					0225	AVEMIDSW =	BIT 1 FLAG 9 149D	AVETOMID CALLING FOR W,MATRIX INTEGR DONT WRITE OVER RN, VN,PIPTIME	NO AVETOMID W INTEGR ALLOW SET UP RN,VN, PIPTIME
A0920									
A0921									
A0922									
09225	REF	10	LAST	61	4712	AVEMDBIT =	BIT1		
A0923								(SET)	(RESET)
0924	REF	11	LAST	61	0106	FLGWRD10 =	STATE +10D	(150-164)	
A0925									
09255	REF	12	LAST	63	0106	RASFLAG =	STATE +10D		
A0926							BIT 15 FLAG 10		
A0927						=	150D		
A0928									
A0929							BIT 14 FLAG 10		
0930					0227	INTFLAG =	151D	INTEGRATION IN PROGRESS	INTEGRATION NOT IN PROGRESS
A0931									
09315	REF	9	LAST	61	4675	INTFLBIT =	BIT14		
A0932							BIT 13 FLAG 10		
A0933						=	152D		
A0934									
A0935							BIT 12 FLAG 10		
A0936						=	153D		
A0938							BIT 11 FLAG 10		
A0939						=	154D		
A0941							BIT 10 FLAG 10		
A0942						=	155D		
A0943									
A0944							BIT 9 FLAG 10		
A0945						=	156D		
A0946									

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A0947
A0948
A0949                                          =       BIT  8 FLAG 10
                                                       157D

A0950
 0951
A0952                          0236    REINTFLG =      BIT  7 FLAG 10
 09525  REF  12  LAST  62      4704    REINTBIT =      BIT7                INTEGRATION ROUTINE INTEGRATION ROUTINE
                                                                           TO BE RESTARTED     NOT TO BE RESTARTED
A0953
A0954
A0955                                          =       BIT  6 FLAG 10
                                                       159D

A0956
A0957
A0958                                          =       BIT  5 FLAG 10
                                                       160D

A0959
A0960
A0961                                          =       BIT  4 FLAG 10
                                                       161D

A0962
A0963
A0964                                          =       BIT  3 FLAG 10
                                                       162D

A0965
A0966
A0967                                          =       BIT  2 FLAG 10
                                                       163D

A0968
A0969
A0970                                          =       BIT  1 FLAG 10
                                                       164D

A0971
 0972  REF  13  LAST  63      0107    FLOWRD11 =      STATE +11D          (165 - 179)

A0973                                                                      (SET)               (RESET)

A0974
A0975
A0976                                          =       BIT 15 FLAG 11
                                                       165D

A0977
A0978
A0979                                          =       BIT 14 FLAG 11
                                                       166D

A0980
A0981                                          =       BIT 13 FLAG 11
                                                       167D
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A0982

A0983                                   BIT 12 FLAG 11
A0984                           =       168D
A0985

A0986                                   BIT 11 FLAG 11
A0987                           =       169D
A0988

A0989                                   BIT 10 FLAG 11
A0990                           =       170D
A0991

A0992                                   BIT  9 FLAG 11
A0993                           =       171D
A0994

A0995                                   BIT  8 FLAG 11
A0996                           =       172D
A0997

A0998                                   BIT  7 FLAG 11
A0999                           =       173D
A1000

A1001                                   BIT  6 FLAG 11
A1002                           =       174D
A1003

A1004                                   BIT  5 FLAG 11
A1005                           =       175D
A1006

A1007                                   BIT  4 FLAG 11
A1008                           =       176D
A1009

A1010                                   BIT  3 FLAG 11
A1011                           =       177D
A1012

A1013                                   BIT  2 FLAG 11
A1014                           =       178D
A1015

A1016                                   BIT  1 FLAG 11
A1017                           =       179D
A1018
```

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P1019 GENERAL ERASABLE ASSIGNMENTS.

```
1020                                0061                SETLOC 61
R1021          INTERRUPT TEMPORARY STORAGE POOL.  (11D)
R1022           (ITEMP1 THROUGH RUPTREG4)

R1023          ANY OF THESE MAY BE USED AS TEMPORARIES DURING INTERRUPT OR WITH INTERRUPT INHIBITED. THE ITEMP SERIES
R1025  IS USED DURING CALLS TO THE EXECUTIVE AND WAITLIST - THE RUPTREGS ARE NOT.

1027
1028  REF  1                       0061    0061  ITEMP1    ERASE
1029  REF  2  LAST  66             0061          WAITEXIT  EQUALS ITEMP1
                                    0061          EXECTEM1  EQUALS ITEMP1

1030
1031  REF  1                       0062    0062  ITEMP2    ERASE
1032  REF  2  LAST  66             0062          WAITBANK  EQUALS ITEMP2
                                    0062          EXECTEM2  EQUALS ITEMP2

1033
1034  REF  1                       0063    0063  ITEMP3    ERASE
1035  REF  2  LAST  66             0063          RUPTSTOR  EQUALS ITEMP3
1036  REF  3  LAST  66             0063          WAITADR   EQUALS ITEMP3
                                    0063          NEWPRIO   EQUALS ITEMP3

1037
1038  REF  1                       0064    0064  ITEMP4    ERASE
1039  REF  2  LAST  66             0064          LOCCTR    EQUALS ITEMP4
                                    0064          WAITTEMP  EQUALS ITEMP4

1040
1041  REF  1                       0065    0065  ITEMP5    ERASE
                                    0065          NEWLOC    EQUALS ITEMP5

1042                                0066    0066  ITEMP6    ERASE
A1043                               0066          NEWLOC+1  EQUALS ITEMP6      DP ADDRESS.

1044                                0067                SETLOC 67
1045                                0067    0067  NEWJOB    ERASE             MUST BE AT LOC 67 DUE TO WIRING.
1046                                0070    0070  RUPTREG1  ERASE
1047                                0071    0071  RUPTREG2  ERASE
1048                                0072    0072  RUPTREG3  ERASE
1049                                0073    0073  RUPTREG4  ERASE
1050  REF  1                        0073          KEYTEMP1  EQUALS RUPTREG4
1051  REF  2  LAST  66              0073          DSRUPTEM  EQUALS RUPTREG4

R1052          FLAGWORD RESERVATIONS.                                         (12D)

1054                                0074    0107  STATE     ERASE  +11D

1055                                0110    0113  FLAGFILL  ERASE  +3        SPACE FOR FUTURE FLAGS
```

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```
R10554          PAD LOAD FOR DAPS                                   (1)

 105S6  REF  1          0110          EMDOT   EQUALS FLAGFILL       I(1)PL (SPS FLOW RATE, SC.AT B+3KG/CS)

R10S57          EXIT FOR V63                                        (1D)

 10S59  REF  2  LAST 67  0112          STATEXIT EQUALS FLAGFILL +2   I(1)  STQ ADDRESS FOR STATEXTP
R10S6           EXEC TEMPORARIES WHICH MAY BE USED BETWEEN CCS NEWJOBS.
R1057           (INTB15+ THROUGH RUPTMXM)                           (32D)

 1059                   0114    0114   INTB15+  ERASE               REFLECTS 15TH BIT OF INDEXABLE ADDRESSES
 1060   REF  1          0114           DSEXIT   EQUALS INTB15+      RETURN FOR DSPIN
 1061   REF  2  LAST 67 0114           EXITEM   EQUALS INTB15+      RETURN FOR SCALE FACTOR ROUTINE SELECT
 1062   REF  3  LAST 67 0114           BLANKRET EQUALS INTB15+      RETURN FOR 2BLANK

 1063                   011S    011S   INTBIT15 ERASE               SIMILAR TO ABOVE.
 1064   REF  1          0115           WRDRET   EQUALS INTBIT15     RETURN FOR SBLANK
 106S   REF  2  LAST 67 011S           WDRET    EQUALS INTBIT15     RETURN FOR DSPWD
 1066   REF  3  LAST 67 0115           DECRET   EQUALS INTBIT15     RETURN FOR PUTCOM(DEC LOAD)
 1067   REF  4  LAST 67 011S           21/22REG EQUALS INTBIT15     TEMP FOR CHARIN

R1066           THE REGISTERS BETWEEN ADDRWD AND PRIORITY MUST STAY IN THE FOLLOWING ORDER FOR INTERPRETIVE TRACE.

 1070                   0116    0116   ADDRWD   ERASE               12 BIT INTERPRETIVE OPERAND SUB-ADDRESS.
 1071                   0117    0117   POLISH   ERASE               HOLDS CADR MADE FROM POLISH ADDRESS.
 1072   REF  1          0117           UPDATRET EQUALS POLISH       RETURN FOR UPDATNN, UPDATVB
 1073   REF  2  LAST 67 0117           CHAR     EQUALS POLISH       TEMP FOR CHARIN
 1074   REF  3  LAST 67 0117           ERCNT    EQUALS POLISH       COUNTER FOR ERROR LIGHT RESET
 107S   REF  4  LAST 67 0117           DECOUNT  EQUALS POLISH       COUNTER FOR SCALING AND DISPLAY (DEC)

 1076                   0120    0120   FIXLOC   ERASE               WORK AREA ADDRESS.
 1077                   0121    0121   OVFIND   ERASE               SET NON-ZERO ON OVERFLOW.

 1076                   0122    0127   VBUF     ERASE +S            TEMPORARY STORAGE USED FOR VECTORS.
 1079   REF  1          0122           SGNON    EQUALS VBUF         TEMP FOR +,- ON
 1080   REF  2  LAST 67 0122           NOUNTEM  EQUALS VBUF         COUNTER FOR MIXNOUN FETCH
 1081   REF  3  LAST 67 0122           DISTEM   EQUALS VBUF         COUNTER FOR OCTAL DISPLAY VERBS
 1082   REF  4  LAST 67 0122           DECTEM   EQUALS VBUF         COUNTER FOR FETCH (DEC DISPLAY VERBS)

 1083   REF  5  LAST 67 0123           SGNOFF   EQUALS VBUF  +1     TEMP FOR +,- ON
 1084   REF  6  LAST 67 0123           NVTEMP   EQUALS VBUF  +1     TEMP FOR NVSUB
 1085   REF  7  LAST 67 0123           SFTEMP1  EQUALS VBUF  +1     STORAGE FOR SF CONST HI PART(=SFTEMP2-1)
 1086   REF  8  LAST 67 0123           HITEMIN  EQUALS VBUF  +1     TEMP FOR LOAD OF HRS, MIN, SEC
A1087                                                               MUST = LOTEMIN-1.
 1088   REF  9  LAST 67 0124           CODE     EQUALS VBUF  +2     FOR DSPIN
 1089   REF 10  LAST 67 0124           SFTEMP2  EQUALS VBUF  +2     STORAGE FOR SF CONST LO PART(=SFTEMP1+1)
 1090   REF 11  LAST 67 0124           LOTEMIN  EQUALS VBUF  +2     TEMP FOR LOAD OF HRS, MIN, SEC
A1091                                                               MUST = HITEMIN+1.
```

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```
1092  REF  12  LAST  67      0125          MIXTEMP  EQUALS VBUF   +3    FOR MIXNOUN DATA
1093  REF  13  LAST  66      0125          SIGNRET  EQUALS VBUF   +3    RETURN FOR +,- ON

R1094  ALSO MIXTEMP+1 = VBUF+4, MIXTEMP+2 = VBUF+5.

1095                          0130  0132  BUF      ERASE  +2
1096                          0133  0134  BUF2     ERASE  +1            TEMPORARY SCALAR STORAGE.
1097  REF  1                  0130        INDEXLOC EQUALS BUF           CONTAINS ADDRESS OF SPECIFIED INDEX.
1098  REF  2  LAST  66        0130        SWWORD   EQUALS BUF           ADDRESS OF SWITCH WORD.
1099  REF  3  LAST  66        0131        SWBIT    EQUALS BUF +1        SWITCH BIT WITHIN SWITCH WORD.
1100                          0135  0135  MPTEMP   ERASE               TEMPORARY USED IN MULTIPLY AND SHIFT.
1101  REF  1                  0135        DMPNTEMP EQUALS MPTEMP        DMPSUB TEMPORARY
1102                          0136  0136  DOTINC   ERASE               COMPONENT INCREMENT FOR DOT SUBROUTINE.
1103  REF  1                  0136        DVSIGN   EQUALS DOTINC        DETERMINES SIGN OF DDV RESULT.
1104  REF  2  LAST  66        0136        ESCAPE   EQUALS DOTINC        USED IN ARCSIN/ARCCOS.
1105  REF  3  LAST  66        0136        ENTRET   EQUALS DOTINC        EXIT FROM ENTER

1106                          0137  0137  DOTRET   ERASE               RETURN FROM DOT SUBROUTINE.
1107  REF  1                  0137        DVNORMCT EQUALS DOTRET        DIVIDEND NORMALIZATION COUNT IN DDV.
1108  REF  2  LAST  66        0137        ESCAPE2  EQUALS DOTRET        ALTERNATE ARCSIN/ARCCOS SWITCH.
1109  REF  3  LAST  68        0137        WDCNT    EQUALS DOTRET        CHAR COUNTER FOR DSPWD
1110  REF  4  LAST  66        0137        INREL    EQUALS DOTRET        INPUT BUFFER SELECTOR ( X,Y,Z, REG )

1111                          0140  0140  MATINC   ERASE               VECTOR INCREMENT IN MXV AND VXM.
1112  REF  1                  0140        MAXDVSW  EQUALS MATINC        +0 IF DP QUOTIENT IS NEAR ONE - ELSE -1.
1113  REF  2  LAST  66        0140        POLYCNT  EQUALS MATINC        POLYNOMIAL LOOP COUNTER
1114  REF  3  LAST  66        0140        DSPMMTEM EQUALS MATINC        DSPCOUNT SAVE FOR DSPMM
1115  REF  4  LAST  66        0140        MIXBR    EQUALS MATINC        INDICATOR FOR MIXED OR NORMAL NOUN

1116                          0141  0141  TEM1     ERASE               EXEC TEMP
1117  REF  1                  0141        POLYRET  EQUALS TEM1
1118  REF  2  LAST  66        0141        DSREL    EQUALS TEM1          REL ADDRESS FOR DSPIN

1119                          0142  0142  TEM2     ERASE               EXEC TEMP
1120  REF  1                  0142        DSMAG    EQUALS TEM2          MAGNITUDE STORE FOR DSPIN
1121  REF  2  LAST  66        0142        IDADDTEM EQUALS TEM2          MIXNOUN INDIRECT ADDRESS STORAGE

1122                          0143  0143  TEM3     ERASE               EXEC TEMP
1123  REF  1                  0143        COUNT    EQUALS TEM3          FOR DSPIN

1124                          0144  0144  TEM4     ERASE               EXEC TEMP
1125  REF  1                  0144        LSTPTR   EQUALS TEM4          LIST POINTER FOR GRABUSY
1126  REF  2  LAST  66        0144        RELRET   EQUALS TEM4          RETURN FOR RELDSP
1127  REF  3  LAST  66        0144        FREERET  EQUALS TEM4          RETURN FOR FREEDSP
1128  REF  4  LAST  66        0144        DSPWDRET EQUALS TEM4          RETURN FOR DSPSIGN
1129  REF  5  LAST  66        0144        SEPSCRET EQUALS TEM4          RETURN FOR SEPSEC
1130  REF  6  LAST  66        0144        SEPMNRET EQUALS TEM4          RETURN FOR SEPMIN

1131                          0145  0145  TEM5     ERASE               EXEC TEMP
1132  REF  1                  0145        NOUNADD  EQUALS TEM5          TEMP STORAGE FOR NOUN ADDRESS
```

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```
 1133                          0146    0146   NNADTEM  ERASE          TEMP FOR NOUN ADDRESS TABLE ENTRY
 1134                          0147    0147   NNTYPTEM ERASE          TEMP FOR NOUN TYPE TABLE ENTRY
 1135                          0150    0150   IDAD1TEM ERASE          TEMP FOR INDIR ADRESS TABLE ENTRY(MIXNN)
A1136                                                                 MUST = IDAD2TEM-1, = IDAD3TEM-2.
 1137                          0151    0151   IDAD2TEM ERASE          TEMP FOR INDIR ADRESS TABLE ENTRY(MIXNN)
A1138                                                                 MUST = IDAD1TEM+1, = IDAD3TEM-1.
 1139                          0152    0152   IDAD3TEM ERASE          TEMP FOR INDIR ADRESS TABLE ENTRY(MIXNN)
A1140                                                                 MUST = IDAD1TEM+2, = IDAD2TEM+1.
 1141                          0153    0153   RUTMXTEM ERASE          TEMP FOR SF ROUT TABLE ENTRY(MIXNN ONLY)

R1142          AX*SR*T STORAGE.                                       (6D)

 1144  REF  3  LAST  68       0142           DEXDEX   EQUALS TEM2     B(1)TMP
 1145  REF  2  LAST  68       0143           DEX1     EQUALS TEM3     B(1)TMP
 1146  REF  7  LAST  68       0144           DEX2     EQUALS TEM4     B(1)TMP
 1147  REF  2  LAST  66       0145           RTNSAVER EQUALS TEM5     B(1)TMP
 1148  REF  1                  0133           TERM1TMP EQUALS BUF2     B(2)TMP

 1149  REF  1                  0143           DEXI     =      DEX1
```

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```
P1150           DYNAMICALLY ALLOCATED CORE SETS FOR JOBS.                    (84D)

 1152                       0154    0162   MPAC     ERASE  +6               MULTI-PURPOSE ACCUMULATOR.
 1153                       0183    0183   MODE     ERASE                   +1 FOR TP, +0 FOR DP, OR -1 FOR VECTOR.
 1154                       0184    0184   LOC      ERASE                   LOCATION ASSOCIATED WITH JOB.
 1155                       0185    0165   BANKSET  ERASE                   USUALLY CONTAINS BBANK SETTING.
 1156                       0186    0188   PUSHLOC  ERASE                   WORD OF PACKED INTERPRETIVE PARAMETERS.
 1157                       0187    0187   PRIORITY ERASE                   PRIORITY OF PRESENT JOB AND WORK AREA.

 1158                       0170    0277          ERASE  +71D               SEVEN SETS OF 12 REGISTERS EACH.

R1159           SPECIAL DOWNLINK BUFFER.-OVERLAYED BY P27 STORAGE-

R1160           P27(UPDATE PROGRAM) STORAGE. -OVERLAYS SPEC DNLNK BUFF-      (24D)

 1162
 1163  REF  1                0300    0327   COMPNUMB ERASE          +23D    B(1)TMP NUMBER OF ITEMS TO BE UPLINKED.
 1164  REF  1                0301           UPOLDMOD EQUALS COMPNUMB +1     B(1)TMP HOLDS INTERRUPTED PROGRAM NUMBER
 1165  REF  1                0302           UPVERB   EQUALS UPOLDMOD +1     B(1) TMP VERB NUMBER
 1166  REF  1                0303           UPCOUNT  EQUALS UPVERB   +1     B(1)TMP UPBUFF INDEX
 1167  REF  1                0304           UPBUFF   EQUALS UPCOUNT  +1     B(20D)

R1168           MORE P27 STORAGE.                                            (2D)

 1170                       0330    0330   UPTEMP   ERASE                   B(1)TMP SCRATCH
 1171                       0331    0331   UPVERBSV ERASE                   B(1)TMP
 1172  REF  1                0330           INTWAK1Q EQUALS UPTEMP           (08D)
R1180           (20 REGISTERS OF ENTRY DOWNLINK WILL GO HERE.)

A1181                                                   THE FOLLOWING ARE INDEXED FOR TM. IN ENTRY DAP.

 1182  REF  1                0304           CMTMTIME =      UPBUFF           B(1) (VEHICLE BODY RATE INFO IS
 1183  REF  1                0305           SW/NDX   =      CMTMTIME +1      B(1)  TELEMETERED EACH 0.2 SEC. DURING
 1184  REF  2  LAST  70      0324.          ENDBUF   =      CMTMTIME +16D    B(1)  ENTRY.)

 11842 REF  1                0325           V1       =      ENDBUF   +1      I(2) REENTRY, P64-P65
 11843 REF  1                0327           A0       =      V1       +2      I(2) REENTRY, P64-P65
A11644                                                                       HI-ORDER WORD ONLY ON DNLNK.
R1185

R1188           ALIGNMENT STORAGE.                                           (5D)
R1186           (CANNOT SHARE WITH PRECISION INTEGRATION OR KEPLER STORAGE.)

 1189  REF  2  LAST  70      0300           QMAJ     EQUALS COMPNUMB         B(1)TMP
 1190  REF  1                0301           MARKINDX EQUALS QMAJ     +1     B(1)TMP
 1191  REF  1                0302           BESTI    EQUALS MARKINDX +1     I(1)TMP
 1192  REF  1                0303           BESTJ    EQUALS BESTI    +1     I(1)TMP
 1193  REF  1                0304           STARIND  EQUALS BESTJ    +1     I(1)TMP
```

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```
R1194           ALIGNMENT/S40.2,3 COMMON STORAGE.                       (18D)

 1196  REF  2 LAST  70   0306          XSMD    EQUALS UPBUFF  +2       I(6)TMP
 1197  REF  1            0314          YSMD    EQUALS XSMD    +6       I(6)TMP
 1198  REF  1            0322          ZSMD    EQUALS YSMD    +8       I(8)TMP

 1199  REF  2 LAST  71   0308          XSCREF  =      XSMD              SPACE CRAFT AXES IN REF COORDS.
 1200  REF  2 LAST  71   0314          YSCREF  =      YSMD
 1201  REF  1            0322          ZSCREF  =      ZSMD
 1202                    0026          ZPRIME  =      22D
 1203                    0026          PDA     =      22D
 1204                    0020          COSTH   =      16D
 1205                    0022          SINTH   =      18D
 1206                    0024          THETA   =      20D
 1207                    0040          STARM   =      32D
R1208           DOWNLINK STORAGE.                                       (18)

12095  REF  1           0332          DNLSTADR EQUALS DNLSTCOD         CONTENTS NO LONGER AN ADDR BUT A CODE

 1210                    0332   0332   DNLSTCOD ERASE                   B(1)PRM ID CODE OF DOWNLIST
 1211                    0333   0333   DUMPCNT  ERASE                   B(1)PRM
 1212                    0334   0334   LDATALST ERASE                   B(1)
 1213                    0335   0335   DNTMGOTO ERASE                   B(1)
 1214                    0336   0336   TMINDEX  ERASE                   B(1)
 1215  REF  1           0336          DUMPLOC  EQUALS TMINDEX          CONTAINS ECADR OF AGC DP WORD BEING DUMP
A1218                                                                   ED AND COUNT OF COMPLETE DUMPS ALREADY S
A1217                                                                   ENT.
 1218                    0337   0337   DNQ      ERASE                   B(1)
 1219                    0340   0353   DNTMBUFF ERASE   +11D           B(12) PRM DOWNLINK SNAPSHOT BUFFER
A1220
R1221           OPTICS MARKING . UNSHARED.                              (8D)

 1223                    0354   0354   MKNDX    ERASE
 1224                    0355   0356   MKT2T1   ERASE   +1
 1225                    0357   0357   MKCDUY   ERASE
 1226                    0360   0360   MKCDUS   ERASE
 1227                    0361   0361   MKCDUZ   ERASE
 1228                    0362   0362   MKCDUT   ERASE
 1229                    0363   0363   MKCDUX   ERASE
R1230           FOR EXCLUSIVE USE OF SYS TEST STANDARD LEAD INS         (2)

 1232                    0364   0365   ERUF2    ERASE   +1              B(2)  UNSHARED
A1233
```

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```
R1234          UNSWITCHED FOR DISPLAY INTERFACE ROUTINES.                    (10D)

 1236                    0366    0366   RESTREG  ERASE                       B(1)PRM FOR DISPLAY RESTARTS
 1237                    0367    0367   NVWORD   ERASE
 1238                    0370    0370   MARKNV   ERASE
 1239                    0371    0371   NVSAVE   ERASE
R1240          (RETAIN THE ORDER OF CADRFLSH TO FAILREG +2 FOR DOWNLINK PURPOSES)
 1242                    0372    0372   CADRFLSH ERASE                       B(1)TMP
 1243                    0373    0373   CADRMARK ERASE                       B(1)TMP
 1244                    0374    0374   TEMPFLSH ERASE                       B(1)TMP
 1245                    0375    0377   FAILREG  ERASE          +2           B(3)PRM  3 ALARM-ABORT USER«S 2CADR

 1246                    0400           SETLOC 400
R1247          VAC AREAS.  -BE CAREFUL OF PLACEMENT-                         (220D)

 1249                    0400    0400   VAC1USE  ERASE                       B(1)PRM
 1250                    0401    0453   VAC1     ERASE  +42D                 B(43)PRM
 1251                    0454    0454   VAC2USE  ERASE                       B(1)PRM
 1252                    0455    0527   VAC2     ERASE  +42D                 B(43)PRM
 1253                    0530    0530   VAC3USE  ERASE                       B(1)PRM
 1254                    0531    0603   VAC3     ERASE  +42D                 B(43)PRM
 1255                    0604    0604   VAC4USE  ERASE                       B(1)PRM
 1256                    0605    0657   VAC4     ERASE  +42D                 B(43)PRM
 1257                    0660    0660   VAC5USE  ERASE                       B(1)PRM
 1258                    0661    0733   VAC5     ERASE  +42D                 B(43)PRM
R1259          WAITLIST REPEAT FLAG.                                         (1D)

 1261                    0734    0734   RUPTAGN  ERASE                       B(1)PRM
 1262  REF  1            0734           KEYTEMP2 =      RUPTAGN
R1263          STARALIGN ERASABLES.                                          (13D)

 1265                    0735    0735   STARCODE ERASE                       B(1)DSP NOUN 70 FOR P22,51 AND R52,53.
 1266                    0736    0751   STARALGN ERASE  +11D
 1267  REF  1            0736           SINCDU   =      STARALGN
 1268  REF  2  LAST 72   0744           COSCDU   =      STARALGN +6

 1269  REF  1            0742           SINCDUX  =      SINCDU   +4
 1270  REF  2  LAST 72   0736           SINCDUY  =      SINCDU
 1271  REF  3  LAST 72   0740           SINCDUZ  =      SINCDU   +2
 1272  REF  1            0750           COSCDUX  =      COSCDU   +4
 1273  REF  2  LAST 72   0744           COSCDUY  =      COSCDU
 1274  REF  3  LAST 72   0746           COSCDUZ  =      COSCDU   +2
R1275          PHASE TABLE AND RESTART COUNTERS.                             (12D)
```

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```
 1277                        0752    0752   -PHASE1  ERASE              B(1)PRM
 1278                        0753    0753   PHASE1   ERASE              B(1)PRM
 1279                        0754    0754   -PHASE2  ERASE              B(1)PRM
 1280                        0755    0755   PHASE2   ERASE              B(1)PRM
 1281                        0756    0756   -PHASE3  ERASE              B(1)PRM
 1282                        0757    0757   PHASE3   ERASE              B(1)PRM
 1283                        0760    0760   -PHASE4  ERASE              B(1)PRM
 1284                        0761    0761   PHASE4   ERASE              B(1)PRM
 1285                        0762    0762   -PHASE5  ERASE              B(1)PRM
 1286                        0763    0763   PHASE5   ERASE              B(1)PRM
 1287                        0764    0764   -PHASE6  ERASE              B(1)PRM
 1288                        0765    0765   PHASE6   ERASE              B(1)PRM
R1289          AX*SR*T STORAGE.                                         (6D)

 1291                        0766    0773   CDUSPOT  ERASE  +5          B(6)

 1292  REF  1                0766           CDUSPOTY =      CDUSPOT
 1293  REF  2  LAST  73'     0770           CDUSPOTZ =      CDUSPOT +2
 1294  REF  3  LAST '' 73    0772           CDUSPOTX =      CDUSPOT +4
R1299          VERB 37 STORAGE.                                         (2D)

 1301                        0774    0774   MINDEX   ERASE              B(1)TMP  INDEX FOR MAJOR MODE
 1302                        0775    0775   MMNUMBER ERASE              B(1)TMP  MAJOR MODE REQUESTED VIA V37
R1303          PINBALL INTERRUPT STORAGE.                               (1D)

 1305                        0776    0776   DSPCNT   ERASE              B(1)PRM DSPOUT COUNTER
R1306          PINBALL EXECUTIVE ACTION.                                (44D)

 1306                        0777    0777   DSPCOUNT ERASE              DISPLAY POSITION INDICATOR
 1309                        1000    1000   DECBRNCH ERASE              +DEC, - DEC, OCT INDICATOR
 1310                        1001    1001   VERBREG  ERASE              VERB CODE
 1311                        1002    1002   NOUNREG  ERASE              NOUN CODE
 1312                        1003    1003   XREG     ERASE              R1 INPUT BUFFER
 1313                        1004    1004   YREG     ERASE              R2 INPUT BUFFER
 1314                        1005    1005   ZREG     ERASE              R3 INPUT BUFFER
 1315                        1006    1006   XREGLP   ERASE              LO PART OF XREG (FOR DEC CONV ONLY)
 1316                        1007    1007   YREGLP   ERASE              LO PART OF YREG (FOR DEC CONV ONLY)
 1317  REF  1                1007           HITEMOUT =      YREGLP      TEMP FOR DISPLAY OF HRS, MIN, SEC
A1318                                                                          MUST = LOTEMOUT-1.
 1319                        1010    1010   ZREGLP   ERASE              LO PART OF ZREG (FOR DEC CONV ONLY)
 1320  REF  1                1010           LOTEMOUT =      ZREGLP      TEMP FOR DISPLAY OF HRS, MIN, SEC
A1321                                                                          MUST = HITEMOUT+1.
```

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```
 1322                          1011    1011   MODREG   ERASE          MODE CODE
 1323                          1012    1012   DSPLOCK  ERASE          KEYBOARD/SUBROUTINE CALL INTERLOCK
 1324                          1013    1013   REGRET   ERASE          RETURN REGISTER FOR LOAD
 1325                          1014    1014   LOADSTAT ERASE          STATUS INDICATOR FOR LOADTST
 1326                          1015    1015   CLPASS   ERASE          PASS INDICATOR CLEAR
 1327                          1016    1016   NOUT     ERASE          ACTIVITY COUNTER FOR DSPTAB
 1328                          1017    1017   NOUNCADR ERASE          MACHINE CADR FOR NOUN
 1329                          1020    1020   MONSAVE  ERASE          N/V CODE FOR MONITOR. (= MONSAVE1-1)
 1330                          1021    1021   MONSAVE1 ERASE          NOUNCADR FOR MONITOR(MATBS) =MONSAVE +1
 1331                          1022    1022   MONSAVE2 ERASE          B(1)PRM NVMONOPT OPTIONS
 1332                          1023    1036   DSPTAB   ERASE  +11D    0-10D, DISPLAY PANEL BUFF. 11D, C/S LTS.
 1333                          1037    1037   NVQTEM   ERASE          NVSUB STORAGE FOR CALLING ADDRESS
A1334                                                                 MUST = NVENKTEM-1
 1335                          1040    1040   NVENKTEM ERASE          NVSUB STORAGE FOR CALLING BANK
A1336                                                                 MUST = NVQTEM+1
 1337                          1041    1041   VERBSAVE ERASE          NEEDED FOR RECYCLE
 1336                          1042    1042   CADRSTOR ERASE          ENDIDLE STORAGE
 1339                          1043    1043   DSPLIST  ERASE          WAITING REG FOR DSP SYST INTERNAL USE
 1340                          1044    1044   EXTVBACT ERASE          EXTENDED VERB ACTIVITY INTERLOCK
 1341                          1045    1047   DSPTEM1  ERASE    +2    BUFFER STORAGE AREA 1 (MOSTLY FOR TIME)
 1342                          1050    1052   DSPTEM2  ERASE    +2    BUFFER STORAGE AREA 2 (MOSTLY FOR DEG)
 1343  REF  1                  1051           DSPTEMX  EQUALS DSPTEM2 +1  B(2) S-S DISPLAY BUFFER FOR EXT. VERBS.
 1344  REF  1                  1045           NORMTEM1 EQUALS DSPTEM1     B(3)DSP NORMAL DISPLAY REGISTERS.
A1345
R13451          DISPLAY FOR EXTENDED VERBS                             (2D)

 13453  REF  1                  1051           OPTIONX  EQUALS DSPTEMX     B(2) EXTENDED VERB OPTION CODE  N12(V62)
A13454

R1346           TBASE S AND PHSPRDT S.                                 (12D)

 1346                          1053    1053   TBASE1   ERASE          B(1)PRM
 1349                          1054    1054   PHSPRDT1 ERASE          B(1)PRM
 1350                          1055    1055   TBASE2   ERASE          B(1)PRM
 1351                          1056    1056   PHSPRDT2 ERASE          B(1)PRM
 1352                          1057    1057   TBASE3   ERASE          B(1)PRM
 1353                          1060    1060   PHSPRDT3 ERASE          B(1)PRM
 1354                          1061    1061   TBASE4   ERASE          B(1)PRM
 1355                          1062    1062   PHSPRDT4 ERASE          B(1)PRM
 1356                          1063    1063   TBASE5   ERASE          B(1)PRM
 1357                          1064    1064   PHSPRDT5 ERASE          B(1)PRM
 1356                          1065    1065   TBASE6   ERASE          B(1)PRM
 1359                          1066    1066   PHSPRDT6 ERASE          B(1)PRM
R1360           MORE UNSWITCHED FOR DISPLAY INF                        (5D).
```

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```
 1362                          1067    1067    EBANKSAV ERASE
 1363                          1070    1070    MARKEBAN ERASE
 1364                          1071    1071    EBANKTEM ERASE
 1365                          1072    1072    MARK2PAC ERASE
 1366                          1073    1073    R1SAVE   ERASE
R1367          IMU COMPENSATION UNSWITCHED ERASABLE.                    (1D)

 1369                          1074    1074    1/PIPADT ERASE          B(1)PRM
 1370   REF  1                 1074            OLDBT1   =      1/PIPADT

R1371          SINGLE PRECISION SUBROUTINE TEMPORARIES.                 (3D)

A1373                                                  SPSIN, SPCOS, SPROOT VARIABLES.
A1374                                                  DO NOT SHARE. THESE ARE USED BY DAPS IN INTERRUPT
A1375                                                  AND CURRENTLY ARE NOT PROTECTED. IF OTHER USERS
A1376                                                  MATERIALIZE, THEN THIS CAN BE CHANGED.

 1377                          1075    1075    HALFY    ERASE
 1378                          1076    1076    ROOTRET  ERASE
 1379                          1077    1077    SQRARG   ERASE
 1360   REF  1                 1075            TEMK     EQUALS HALFY
 1361   REF  1                 1076            SQ       EQUALS ROOTRET
```

L ERASABLE ASSIGNMENTS


```
P1362           UNSWITCHED FOR ORBIT INTEGRATION.                       (21D)

 1364                        1100    1124   TDEC      ERASE  +20D
 1365   REF  1               1102           COLREG    EQUALS TDEC      +2    I(2)
 1366   REF  1               1103           LAT       EQUALS COLREG    +1    I(1)
 1367   REF  1               1103           LANDLAT   =      LAT             I(2)DSP NOUN 43,67 FOR P20,22,51 R52,53.
 1368   REF  2  LAST  76     1105           LONG      EQUALS LAT       +2            NOUN 69    FOR P22.
 1369   REF  1               1107           ALT       EQUALS LONG      +2    I(2)DSP NOUN 43,67 FOR P20,22,51 R52,53.
 1390   REF  1               1111           VV        EQUALS ALT       +2    I(2)DSP NOUN 43    FOR P20,22,51 R52,53.
 1391   REF  1               1117           ZV        EQUALS VV        +6    I(6)
R1392
R1393           MARK STORAGE.                                               (2)

 1395                        1125    1125   VHFCNT    ERASE                 B(1) PRM NO. OF VHF MARKS(P20(R22)).
 1396                        1126    1126   TRKMKCNT  ERASE                 B(1) PRM NO. OF VHF MARKS (P20(R22)).

 1397   REF  1               1126           MARKCTR   =      TRKMKCNT       B(1) MARK COUNTER USED BY R32
R1396           MISCELLANEOUS UNSWITCHED.                                   (16D)

 1400                        1127    1127   IRETURN1  ERASE                 B(1)  RET ADDR USED BY MIDTOAV1 AND 2
A1401                                                                       CALLED BY P40,P41,P42,  P61,P62
 1402                        1130    1130   RATEINDX  ERASE                  (1)    USED BY KALCMANU
 1403                        1131    1131   OPTION1   ERASE                 B(1)   NOUN 06 USES THIS
 1404                        1132    1132   OPTION2   ERASE                 B(1)   NOUN 06 USES THIS
 1405                        1133    1134   LONGCADR  ERASE  +1            B(2)    LONGCALL REGISTER
 1406                        1135    1136   LONGBASE  ERASE  +1            B(2)    LONGCALL REGISTER
 1407                        1137    1140   LONGTIME  ERASE  +1            B(2)    LONGCALL REGISTER
 1408                        1141    1144   DELAYLOC  ERASE         +3
 1409                        1145    1145   NVWORD1   ERASE                 B(1)
 1410                        1146    1146   TEMPR60   ERASE                 B(1)
 1411                        1147    1147   PRIOTIME  ERASE                 B(1)
 1412   REF  1               1127           P30/RET   EQUALS IRETURN1
A14125
R14129          MISC.  INCLUDING RESTART COUNTER, GIMBAL ANGLE  SAVE  AND
R1413           STANDBY VERB ERASABLES. REDOCTR BEFORE THETAD (DWNLNK)      (16D)

 1415                        1150    1151   TIME2SAV  ERASE  +1            B(2)TMP
 1416                        1152    1153   SCALSAVE  ERASE  +1            B(2)TMP
 1417                        1154    1154   REDOCTR   ERASE                 B(1)PRM CONTAINS NUMBER OF RESTARTS.
 1418                        1155    1157   THETAD    ERASE  +2            B(3)PRM DESIRED GIM ANGLES FOR MANEUVER.
 1419   REF  1               1155           CPHI      =      THETAD                 (OUTER)
 1420   REF  2  LAST  76     1156           CTHETA    =      THETAD   +1            (INNER)
 1421   REF  3  LAST  76     1157           CPSI      =      THETAD   +2            (MIDDLE)
```

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```
R14211          ENTRY VARIABLES SHARED FOR TM.

 14212  REF  4  LAST  76      1155            RDOTREF  =       THETAD          I(2)    P65
 14213  REF  1                1157            VREF     =       RDOTREF +2      I(2)    P65   HI-ORDER WORD ONLY DNLNKαD
 1422                         1160    1160    DESOPTT  ERASE                   B(1)DSP NOUN 92 FOR P20,22,52, R52.
 1423                         1161    1161    DESOPTS  ERASE                   B(1)DSP NOUN 92 FOR P20,22,52, R52.

 1424                         1162    1167    DELV     ERASE   +5              I(6)
 1425  REF  1                1162            DELVX    =       DELV
 1426  REF  2  LAST  77      1164            DELVY    =       DELV    +2
 1427  REF  3  LAST  77      1166            DELVZ    =       DELV    +4
R14271          P20, CONICS   (SHARING WITH TIME 2 SAV AND SCAL SAV ONLY)      (3D)

 14273  REF  1                1150            POINTEX  EQUALS  TIME2SAV       I(1) POINT AXS EXIT
 14274  REF  1                1151            VHFTIME  EQUALS  POINTEX  +1    I(2) DOWNLINK OF VHF RANGE TIME +1M
A14275
R1428           PERM STATE VECTORS FOR BOOST AND DOWNLINK -WHOLE MISSION-      (14D)

 1430                         1170    1175    RN       ERASE   +5              B(6)PRM
 1431                         1176    1203    VN       ERASE   +5              B(6)PRM
 1432                         1204    1205    PIPTIME  ERASE   +1              B(2)PRM (MUST BE FOLLOWED BY GDT/2)
R1433           SERVICER STORAGE.                                              (45D)

R1435           (SERVICER STORAGE AND P11 STORAGE IN UNSWITCHED SHOULD NOT
R1436           OVERLAY EACH OTHER AND THE TOTAL ERASABLE REQUIRED SHOULD NOT
R1437           EXCEED THE ERASABLE STORAGE REQUIRED BY RENDEZVOUS GUIDANCE)

 1436  REF  1                1206            GDT/2    EQUALS  PIPTIME  +2     B(6)TMP (MUST FOLLOW PIPTIME)
 1439  REF  1                1214            GOBL/2   EQUALS  GDT/2    +6     B(6)TMP
 1440  REF  1                1222            AVEGEXIT EQUALS  GOBL/2   +6     B(2)TMP
 1441  REF  1                1222            AVGEXIT  =       AVEGEXIT
 1442  REF  2  LAST  77      1224            TEMX     EQUALS  AVEGEXIT +2     B(1)TMP
 1443  REF  1                1225            TEMY     EQUALS  TEMX     +1     B(1)TMP
 1444  REF  1                1226            TEMZ     EQUALS  TEMY     +1     B(1)TMP
 1445  REF  1                1227            PIPCTR   EQUALS  TEMZ     +1     B(1)TMP
 1446  REF  1                1230            PIPAGE   EQUALS  PIPCTR   +1     B(1)TMP
 1447  REF  1                1231            RN1      EQUALS  PIPAGE   +1     B(6)TMP
 1448  REF  3  LAST  33      1237            VN1      EQUALS  RN1      +6     B(6)TMP
 1449  REF  1                1245            PIPTIME1 EQUALS  VN1      +6     B(2)TMP
 1450  REF  1                1247            GDT1/2   EQUALS  PIPTIME1 +2     B(6)TMP
 1451  REF  1                1255            GOBL1/2  EQUALS  GDT1/2   +6     B(6)TMP
A1452
```

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```
R1453           ENTRY STORAGE.                                                  (1D)

 1455   REF  1                  1283          ENTRYVN  EQUALS GOBL1/2  +6     B(1)TMP VN CODE FOR ENTRY DISPLAYS P60S.
A1456
R1457           P11 STORAGE.                                                    (9D)

 1459   REF  1                  1283          PADLONG  EQUALS ENTRYVN          (2)PL   LONGITUDE OF LAUNCH PAD
 1460   REF  1                  1285          LIFTTEMP EQUALS PADLONG  +2      (2)TMP
 1461   REF  1                  1287          TEPHEM1  EQUALS LIFTTEMP +2      (3)TMP
 1462   REF  1                  1272          PGNCSALT EQUALS TEPHEM1  +3      (2)PL   ALTITUDE
R1463           RENDEZVOUS NAVIGATION STORAGE.(SEE COMMENT IN SERVICER STORAGE)(58D)

 1465
 1466   REF  1                  1206   1277   CSMPOS   ERASE  +57D            I(6)TMP
 1467   REF  1                  1214          LEMPOS   EQUALS CSMPOS   +6      I(6)TMP
 1468   REF  1                  1222          RCL      EQUALS LEMPOS   +6      I(2)TMP
 1469   REF  1                  1224          MARKTIME EQUALS RCL      +2      B(2)TMP
 1470   REF  1                  1226          VTEMP    EQUALS MARKTIME +2      B(6)TMP
 1471   REF  1                  1234          UM       EQUALS VTEMP    +6      I(6)TMP
 1472   REF  1                  1242          MARKDATA EQUALS UM       +6      B(2)TMP
 1473   REF  1                  1244          USTAR    EQUALS MARKDATA +2      I(6)TMP
 1474   REF  1                  1252          WIXA     EQUALS USTAR    +6      B(1)TMP
 1475   REF  1                  1253          WIXB     EQUALS WIXA     +1      B(1)TMP
 1476   REF  1                  1254          ZIXA     EQUALS WIXB     +1      B(1)TMP
 1477   REF  1                  1255          ZIXB     EQUALS ZIXA     +1      B(1)TMP
                                 1256          DELTAX   EQUALS ZIXB     +1      I(16)TMP
 1478   REF  1                  1256          VHFRANGE EQUALS DELTAX           (2)
 1479   REF  2  LAST  78        1272          UCL      EQUALS DELTAX   +12D    (6)     LM-CSM LINE OF SIGHT 1/2 UNIT V
R1480           **** CONICSEX (MEAS INC) ****

 1481   REF  3  LAST  78        1256          TRIPA    EQUALS DELTAX
 1482   REF  4  LAST  78        1261          TEMPVAR  EQUALS DELTAX   +3
A1483
 1484
R1485           T4RUPT ERASABLE.        1300   1301   TEMPOR1  ERASE  +1              B(2)TMP
                                                                                (6D)
 1487                            1302   1302   DSRUPTSW ERASE
 1488                            1303   1303   OPTIND   ERASE
 1489                            1304   1304   LGYRO    ERASE
 1490                            1305   1308   COMMANDO ERASE  +1
```

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```
 1491                          1307    1307   ZONE     ERASE                 B(1)PRM USED IN SHAFT STOP MONITOR
 1492  REF  1                  0035           LASTYCMD =       OPTY         DUMMY TO MAKE RR BENCH TEST ASSEMBLE
 1493  REF  2  LAST  79        0035           LASTXCMD =       OPTY         DUMMY TO MAKE RR BENCH TEST ASSEMBLE
R1494          UNSWITCHED DAP ERASABLE.                                     (4D)

 1496                          1310    1310   T6LOC    ERASE
 1497                          1311    1311   T6ADR    ERASE
 1498                          1312    1313   TSLOC    ERASE  +1
R1499          MODE SWITCHING ERASABLE.                                     (14D)

 1501                          1314    1314   SWSAMPLE ERASE                B(1)PRM
 1502                          1315    1315   DESOPMOD ERASE                B(1)PRM
 1503                          1316    1316   WTOPTION ERASE                B(1)PRM
 1504                          1317    1317   ZOPTCNT  ERASE                B(1)PRM
 1505                          1320    1320   IMODES30 ERASE                B(1)PRM
 1506                          1321    1321   IMODES33 ERASE                B(1)PRM
 1507                          1322    1324   MODECADR ERASE  +2            B(3)TMP
 1508  REF  1                  1322           IMUCADR  =       MODECADR
 1509  REF  2  LAST  79        1323           OPTCADR  =       MODECADR +1
 1510  REF  3  LAST  79        1324           RADCADR  =       MODECADR +2
 1511                          1325    1327   ATTCADR  ERASE  +2            B(3)PRM
 1512  REF  1                  1327           ATTPRIO  =       ATTCADR  +2
 1513                          1330    1330   MARKSTAT ERASE                B(1)PRM
 1514                          1331    1331   OPTMODES ERASE                B(1)PRM
A1515
R1516          RCSDAP ERASABLE.                                             (1D)

 1518                          1332    1332   HOLDFLAG ERASE                B(1)PRM
A1519
A1520
R1524          CRS61.1 STORAGE.  -USED IN R63 (VERB 89)-                    (5D)

 1526                          1333    1335   CPHIX    ERASE  +2            B(3)DSP NOUN 96 CALCULATED BY CRS61.1
A1527
 1528                          1338    1337   TEVENT   ERASE  +1            B(2)     TIME OF EVENT FOR DOWNLIST
 1529  REF  1                  1338           TLIFTOFF =       TEVENT
```

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```
R1530          P34-P35 STORAGE                                          (1D)

 1532                        1340    1340   NORMEX  ERASE
A1533
R1535          SELF-CHECK ASSIGNMENTS.                                  (17D)

R1537                              (DO NOT MOVE, S-C IS ADDRESS SENSITIVE)

 1538                       1357    1377   SELFERAS ERASE  1357 - 1377     ***MUST NOT BE MOVED***
 1539  REF  1              1357           SFAIL    EQUALS SELFERAS         B(1)
 1540  REF  1              1360           ERESTORE EQUALS SFAIL    +1      B(1)
 1541  REF  1              1361           SELFRET  EQUALS ERESTORE +1      B(1)    RETURN
 1542  REF  1              1362           SMODE    EQUALS SELFRET  +1      B(1)
 1543  REF  1              1363           ALMCADR  EQUALS SMODE    +1      B(2)    ALARM-ABORT USER«S 2CADR
 1544  REF  1              1365           ERCOUNT  EQUALS ALMCADR  +2      B(1)
 1545  REF  1              1366           SCOUNT   EQUALS ERCOUNT  +1      B(3)
 1548  REF  1              1371           SKEEP1   EQUALS SCOUNT   +3      B(1)
 1547  REF  1              1372           SKEEP2   EQUALS SKEEP1   +1      B(1)
 1546  REF  1              1373           SKEEP3   EQUALS SKEEP2   +1      B(1)
 1549  REF  1              1374           SKEEP4   EQUALS SKEEP3   +1      B(1)
 1550  REF  1              1375           SKEEP5   EQUALS SKEEP4   +1      B(1)
 1551  REF  1              1376           SKEEP6   EQUALS SKEEP5   +1      B(1)
 1552  REF  1              1377           SKEEP7   EQUALS SKEEP6   +1      B(1)
A1553
R1554          USED BY P30 ROUTINES TO WRITE ONLY NEVER READ IN COLOSSUS

 1555  REF  1              0000           DISPDEX  EQUALS A
R1556          ERASABLE FOR SXTMARK CDU CHECK DELAY.  -PAD LOADED-      (1D)

 1556                       1341    1341   CDUCHKWD ERASE                  B(1) PL
R15562         R57 STORAGE.  -MUST BE UNSHARED EXCEPT IN BOOST OR ENTRY-  (1D)

 15583                      1342    1342   TRUNBIAS ERASE                  B(1)PRM RESULT OF R57 CALIBR OF TRUNION
A15584
R15585         KEPLER  STORAGE                                           (6D)

 15587                      1343    1344   XMODULO  ERASE          +1      I(2) GREATER 2PI KEPLER
 15588                      1345    1346   TMODULO  ERASE          +1      I(2) GREATER 2 KEPLER
 15589                      1347    1350   EPSILONT ERASE          +1      I(2) TMP
A1559
```

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```
R1560           P37   **RETURN TO EARTH  (PAD LOAD) ****                  (2D)

 1561                        1351    1352  RTED1    ERASE          +1     I(2)PL VGAMMA POLY COEF                B-3
R1562           P40   ***STEERING ROUTINE*** PAD LOAD                     (1D)

 1564                        1353    1353  DVTHRESH ERASE                I(1)PL  DELTA V THRESHOLD FOR LOW THRUST
A1565                                                                            ROUTINE                        B-2
R15651          P23    ***PAD LOAD****                                     (2D)

 15653                       1354    1355  HORIZALT ERASE          +1     I(2)PL  HORIZION ALTITUDE      M B-29
R1566           P-20       ALTERNATE LOS VARIANCE      PAD LOAD*****      (1D)

A1568                                                                                                    -16
 1569                        1356    1356  ALTVAR   ERASE                I(2)PL MILLARD. SQUARED SCALED 2
 1570   REP  2  LAST  80     1377          END-UE   EQUALS SELFERAS +16D  LAST USED UNSWITCHED ERASABLE
```

```
P3000                   EBANK=3 ASSIGNMENTS

 3001                       E3,1400                      SETLOC 1400

R3002           WAITLIST TASK LISTS.                                    (28D)

 3004                   E3,1400  E3,1407   LST1     ERASE  +7          B(8D)PRM  DELTA T S.
 3005                   E3,1410  E3,1431   LST2     ERASE  +17D        B(18D)PRM TASK 2CADR ADDRESSES.
R3006           RESTART STORAGE.                                        (2D)

 3008                   E3,1432  E3,1433   RSBBQ    ERASE  +1          B(2)PRM SAVE BB AND Q FOR RESTARTS.
R3009           MORE LONGCALL STORAGE. (MUST BE IN LST1 S BANK).        (2D)

 3011                   E3,1434  E3,1435   LONGEXIT ERASE  +1          B(2)TMP MAY BE SELDOM OVERLAYED.
R3012           PHASE-CHANGE LISTS PART II.                             (12D)

 3014                   E3,1436  E3,1436   PHSNAME1 ERASE              B(1)PRM
 3015                   E3,1437  E3,1437   PHSBB1   ERASE              B(1)PRM
 3016                   E3,1440  E3,1440   PHSNAME2 ERASE              B(1)PRM
 3017                   E3,1441  E3,1441   PHSBB2   ERASE              B(1)PRM
 3018                   E3,1442  E3,1442   PHSNAME3 ERASE              B(1)PRM
 3019                   E3,1443  E3,1443   PHSBB3   ERASE              B(1)PRM
 3020                   E3,1444  E3,1444   PHSNAME4 ERASE              B(1)PRM
 3021                   E3,1445  E3,1445   PHSBB4   ERASE              B(1)PRM
 3022                   E3,1446  E3,1448   PHSNAME5 ERASE              B(1)PRM
 3023                   E3,1447  E3,1447   PHSBB5   ERASE              B(1)PRM
 3024                   E3,1450  E3,1450   PHSNAME6 ERASE              B(1)PRM
 3025                   E3,1451  E3,1451   PHSBB8   ERASE              B(1)PRM
R3026           IMU COMPENSATION PARAMETERS.                            (22D)

 3028
 3029  REF  1           E3,1452  E3,1452   PBIASX   ERASE              B(1)  PIPA BIAS, PIPA SCALE FACTR TERMS
 3030                   E3,1452            PIPABIAS =      PBIASX          INTERMIXED.
 3031  REF  1           E3,1453  E3,1453   PIPASCFX ERASE
 3032                   E3,1453            PIPASCF  =      PIPASCFX
 3033                   E3,1454  E3,1454   PBIASY   ERASE
 3034                   E3,1455  E3,1455   PIPASCFY ERASE
 3035                   E3,1456  E3,1456   PBIASZ   ERASE
                        E3,1457  E3,1457   PIPASCFZ ERASE

 3036                   E3,1480  E3,1460   NBDX     ERASE              GYRO BIAS DRIFTS
 3037  REF  1           E3,1460            GBIASX   =      NBDX
 3038                   E3,1461  E3,1461   NBDY     ERASE
```

```
 3039                        E3,1462  E3,1462  NBDZ     ERASE

 3040                        E3,1463  E3,1463  ADIAX    ERASE              ACCELERATION SENSITIVE DRIFT ALONG THE
 3041                        E3,1464  E3,1464  ADIAY    ERASE                  INPUT AXIS
 3042                        E3,1465  E3,1465  ADIAZ    ERASE

 3043                        E3,1466  E3,1466  ADSRAX   ERASE              ACCELERATION SENSITIVE DRIFT ALONG THE
 3044                        E3,1467  E3,1467  ADSRAY   ERASE                  SPIN REFERENCE AXIS
 3045                        E3,1470  E3,1470  ADSRAZ   ERASE

 3046                        E3,1471  E3,1476  GCOMP    ERASE  +5           CONTAINS COMPENSATING TORQUES

 3047                        E3,1477  E3,1477  GCOMPSW  ERASE
 3048  REF  1                E3,1471           COMMAND  EQUALS GCOMP
 3049  REF  2  LAST  83      E3,1474           CDUIND   EQUALS GCOMP  +3
R3050          STATE VECTORS FOR ORBIT INTEGRATION.                        (44D)

R3052                                (DIFEQCNT THRU XKEP MUST BE IN SAME
R3053                                 EBANK AS RRECTCSM, RRECTLEM ETC
R3054                                 BECAUSE THE COPY-CYCLES (ATOPCSM,
R3055                                 PTOACSM ETC) ARE EXECUTED IN BASIC.
R3056                                  ALL OTHER REFERENCES TO THIS GROUP
R3057                                 ARE BY INTERPRETIVE INSTRUCTIONS.)

 3056                        E3,1500  E3,1553  DIFEQCNT ERASE  +43D         B(1)TMP
R3059                                (UPSVFLAG...XKEP MUST BE KEPT IN ORDER)

 3060  REF  1                E3,1501           UPSVFLAG EQUALS DIFEQCNT +1  B(1)PRM UPDATE FLAG
 3061  REF  1                E3,1502           RRECT    EQUALS UPSVFLAG +1  B(8)TMP POS AT RECT          KM*2(-14)
 3062  REF  1                E3,1510           VRECT    EQUALS RRECT    +6  B(8)TMP VEL AT RECT      KM(-1/2)*2(8)
 3063  REF  1                E3,1516           TET      EQUALS VRECT    +6  B(2)TMP TIME OF STATE VECT  CSECS*2(-28)
 3064  REF  1                E3,1520           TDELTAV  EQUALS TET      +2  B(8)TMP POSITION DEVIATION     KM*2(14)
 3065  REF  1                E3,1526           TNUV     EQUALS TDELTAV  +6  B(8)TMP VEL DEVIATION    KM(-1/2)*2(14)
 3066  REF  1                E3,1534           RCV      EQUALS TNUV     +6  B(8)TMP CONIC POSITION       KM*2(-14)
 3066  REF  1                E3,1542           VCV      EQUALS RCV      +6  B(8)TMP CONIC VELOCITY    KM(-1/2)*2(8)
 3070  REF  1                E3,1550           TC       EQUALS VCV      +6  B(2)TMP TIME SINCE RECTIFICATION
 3071  REF  1                E3,1552           XKEP     EQUALS TC       +2  B(2)TMP ROOT OF KEPLER EQ KM(1/2.*2(-10)

R3072          **** TEMP - IN VAC AREA ****
 3073                          0022           RRECT1   EQUALS 18D
 3074                          0030           VRECT1   EQUALS 24D
 3075                          0036           TET1     EQUALS 30D
A3076
R3077          PERMANENT STATE VECTORS AND TIMES.                          (101D)

R3079          (DO NOT OVERLAY WITH ANYTHING AFTER BOOST)
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L ERASABLE ASSIGNMENTS


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R3080           (RRECTCSM ...XKEPCSM MUST BE KEPT IN THIS ORDER)

 3081                       E3,1554  E3,1561  RRECTCSM ERASE  +5          B(6)PRM CSM VARIABLES.
 3082  REF   1              E3,1554           RRECTHIS =      RRECTCSM
 3083                       E3,1582  E3,1567  VRECTCSM ERASE  +5          B(8)PRM
 3084                       E3,1570  E3,1571  TETCSM   ERASE  +1          B(2)PRM
 3085  REF   1              E3,1570           TETTHIS  =      TETCSM
 3086                       E3,1572  E3,1577  DELTACSM ERASE  +5          B(6)PRM
 3087                       E3,1600  E3,1605  NUVCSM   ERASE  +5          B(6)PRM
 3088                       E3,1808  E3,1613  RCVCSM   ERASE  +5          B(6)PRM
 3089                       E3,1614  E3,1821  VCVCSM   ERASE  +5          B(6)PRM
 3090                       E3,1822  E3,1623  TCCSM    ERASE  +1          B(2)PRM
 3091                       E3,1824  E3,1825  XKEPCSM  ERASE  +1          B(2)PRM

R3092           (RRECTLEM ...XKEPLEM MUST BE KEPT IN THIS ORDER)

 3093                       E3,1626  E3,1833  RRECTLEM ERASE  +5          B(8)PRM LEM VARIABLES
 3094  REF   1              E3,1826           RRECTOTH =      RRECTLEM
 3095                       E3,1634  E3,1641  VRECTLEM ERASE  +5          B(8)PRM
 3096                       E3,1642  E3,1843  TETLEM   ERASE  +1          B(2)PRM
 3097  REF   1              E3,1842           TETOTHER =      TETLEM
 3098                       E3,1644  E3,1651  DELTALEM ERASE  +5          B(6)PRM
 3099                       E3,1852  E3,1657  NUVLEM   ERASE  +5          B(8)PRM
 3100                       E3,1660  E3,1665  RCVLEM   ERASE  +5          B(8)PRM
 3101                       E3,1868  E3,1673  VCVLEM   ERASE  +5          B(6)PRM
 3102                       E3,1674  E3,1675  TCLEM    ERASE  +1          B(2)PRM
 3103                       E3,1676  E3,1677  XKEPLEM  ERASE  +1          B(2)PRM

 3104                       E3,1700  E3,1705  X789     ERASE  +5
 3105                       E3,1706  E3,1710  TEPHEM   ERASE         +2
 3106                       E3,1711  E3,1712  AZO      ERASE         +1
 3107                       E3,1713  E3,1720  UNITW    ERASE         +5
 3108  REF   1              E3,1713           -AYO     EQUALS UNITW            (2)
 3109  REF   2  LAST  64    E3,1715           AXO      EQUALS UNITW  +2        (2)
A31095
R3110           STATE VECTORS FOR DOWNLINK.                                   (12D)

 3112                       E3,1721  E3,1728  R-OTHER  ERASE  +5          B(8)PRM POS VECT (OTHER VECH) FOR DNLINK
 3113                       E3,1727  E3,1734  V-OTHER  ERASE  +5          B(6)PRM VEL VECT (OTHER VECH) FOR DNLINK

 3114  REF   2  LAST  84    E3,1842           T-OTHER  =      TETLEM                TIME (OTHER VECH) FOR DNLINK
R3115           REFSMMAT.                                                     (18D)

 3117                       E3,1735  E3,1758  REFSMMAT ERASE  +17D         I(18D)PRM
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R3118           AVERAGEG INTEGRATOR STORAGE.                        (8D)

 3120                       E3,1757  E3,1764   UNITR    ERASE  +5
 3121                       E3,1765  E3,1768   RMAG     ERASE  +1
R3126       **** CONICSEX (PLANETARY INERT. ORIEN.) ****

 3127   REF  1             E3,1708             TIMSUBO  EQUALS TEPHEM       CSEC B-42 (TRIPLE PREC)
 3128   REF  1             E3,1787             END-E3   EQUALS RMAG    +2   NEXT UNUSED E3 ADDRESS
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P4000                    EBANK=4 ASSIGNMENTS

 4001                    E4,1400                    SETLOC 2000
R4002          P20 STORAGE.          -PAD LOADED-                    (4D)

 4004                    E4,1400  E4,1400  WRENDPOS ERASE             B(1)PL                    M B-14
 4005                    E4,1401  E4,1401  WRENDVEL ERASE             B(1)PL                    M/CSECB0
 4006                    E4,1402  E4,1402  RMAX     ERASE             B(1)PL                    METERS*2(-19)
 4007                    E4,1403  E4,1403  VMAX     ERASE             B(1)PL                    M/CSEC*2(-7)
R4008          P22 STORAGE.          -PAD LOADED-                    (5D)

 4010                    E4,1404  E4,1404  WORBPOS  ERASE             B(1)PL                    M B-14
 4011                    E4,1405  E4,1405  WORBVEL  ERASE             B(1)PL                    M/CSECB0
 4012                    E4,1406  E4,1406  S22WSUBL ERASE             B(1)PL                    M B-14
 40125                   E4,1407  E4,1410  RPVAR    ERASE      +1     B(2)PL
R4013          CONISEX STORAGE.      -PAD LOADED-                    (6D)

 4015                    E4,1411  E4,1416  504LM    ERASE      +5     I(6)MOON LIBRATION VECTOR
A4016
R4017          ENTRY STORAGE.        -PAD LOADED-                    (2D)

 4019                    E4,1417  E4,1420  EMSALT   ERASE +1          I(2)PL
R4020          P35 CONSTANTS.        -PAD LOADED-                    (4D)

 4022                    E4,1421  E4,1422  ATIGINC  ERASE +1          B(2)PL
 4023                    E4,1423  E4,1424  PTIGINC  ERASE +1          B(2)PL
R40341         LUNAR LANDING SIGHT DATA. -PAD LOADED-                 (6D)
R40342         (USED BY INTEGRATION INITIALIZATION,LAT-LONG SUBROUTINES, P30«S)

 40343                   E4,1425  E4,1432  RLS      ERASE      +5     I(6) PL  LUNAR LANDING SIGHT VECTOR
A40345
R4035   CONISEX (LUNAR AND SOLAR EPHEM)STORAGE. -PAD LOADED-           (77D)

 4037                    E4,1433  E4,1547  TIMEMO   ERASE      +76D
 4038   REF  1           E4,1436           VECOEM   EQUALS TIMEMO +3
 4039   REF  1           E4,1532           RESO     EQUALS VECOEM +60D
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 4040  REF  1            E4,1540          VESO     EQUALS RESO +6
 4041  REF  1            E4,1546          OMEGAES  EQUALS VESO +6
R4043          FULL INTEGRATION STORAGE.                              (95D)

 4045                     E4,1550  E4,1550 PBODY    ERASE                  I(1)
 4046  REF  1            E4,1551          ALPHAV   EQUALS PBODY   +1     I(6)TMP
 4047  REF  1            E4,1557          BETAV    EQUALS ALPHAV  +6     I(6)TMP
 4048  REF  1            E4,1565          PHIV     EQUALS BETAV   +6     I(6)TMP
 4049  REF  1            E4,1573          PSIV     EQUALS PHIV    +6     I(6)TMP
 4050  REF  1            E4,1601          PV       EQUALS PSIV    +6     I(6)TMP
 4051  REF  1            E4,1607          BETAM    EQUALS PV      +6     I(6)TMP
 4052  REF  1            E4,1611          H        EQUALS BETAM   +2     I(2)TMP
 4053  REF  1            E4,1613          QMODE    EQUALS H       +2     I(1)TMP
 4054  REF  1            E4,1614          IRETURN  EQUALS QMODE   +1     I(1)TMP
 4055  REF  1            E4,1615          NORMGAM  EQUALS IRETURN +1     I(1)TMP
 4056  REF  1            E4,1616          VECTAB   EQUALS NORMGAM +1     I(36)TMP
 4057  REF  1            E4,1662          RPOV     EQUALS VECTAB  +36D    (6)TMP VECTOR PRIMARY TO SECONDARY BODY
 4058  REF  1            E4,1670          ORIGEX   EQUALS RPOV    +6     B(1)TMP QSAVE FOR COORD. SWITCH. ROUTINE
 4059  REF  1            E4,1670          KEPRTN   EQUALS ORIGEX         QSAVE FOR KEPLER
 4060  REF  2  LAST  67  E4,1671          ROVV     EQUALS ORIGEX  +1     (6)    SEC.BODY TO VEH.VETOR(USED P23)
 4061  REF  1            E4,1677          RPSV     EQUALS ROVV    +6     (6)TMP SUN TO PRIMARY BODY VECTOR
 4062  REF  1            E4,1705          XKEPNEW  EQUALS RPSV    +6     (2)TMP ROOT OF KEPLERS EQU FOR TIME TAU
R4064          THESE PROBABLY CAN SHARE INTEGRATION VARIABLES.        (9D)

 4066  REF  2  LAST  87  E4,1624          VACX     EQUALS VECTAB  +8     I(2)TMP
 4067  REF  1            E4,1626          VACY     EQUALS VACX    +2     I(2)TMP
 4066  REF  1            E4,1630          VACZ     EQUALS VACY    +2     I(2)TMP

 4069  REF  3  LAST  87  E4,1640          ERADM    EQUALS VECTAB  +18D    I(2)TMP
 4070  REF  1            E4,1642          INCORPEX EQUALS ERADM   +2     I(1)TMP
R4071          R31(V83) STORAGE. -SHARES WITH INTEGRATION STORAGE-    (28D)
A4074

 4075  REF  4  LAST  87  E4,1624          BASEOTP  EQUALS VECTAB  +6     I(6)   BASE POS VECTOR OTHER VEH
 4076  REF  5  LAST  87  E4,1640          BASEOTV  EQUALS VECTAB  +18D   I(6)   BASE VEL VECTOR OTHER VEH
 4077  REF  6  LAST  87  E4,1654          BASETHP  EQUALS VECTAB  +30D   I(6)   BASE POS VECTOR THIS VEH
 4078  REF  2  LAST  87  E4,1662          BASETHV  EQUALS RPOV           I(6)   BASE VEL VECTOR THIS VEH
 4079  REF  2  LAST  87  E4,1671          BASETIME EQUALS ROVV           I(2)   TIME ASSOC WITH BASE VECS
 4080  REF  3  LAST  87  E4,1673          ORIG     EQUALS ROVV    +2     I(1)   =0 FOR EARTH =+2 FOR MOON
R4081

R4082          CONIC INTEGRATION STORAGE.    -MAY NOT SHARE WITH SERVICER-  (6D)

 4085  REF  1            E4,1707          ALPHAM   EQUALS XKEPNEW +2     I(2)TMP
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 4086  REF  1              E4,1711          TAU.      EQUALS ALPHAM  +2    I(2)TMP
 4086  REF  1              E4,1713          DT/2      EQUALS TAU.    +2    I(2)TMP
R4089          P21 STORAGE.                                                (2D)

 4091  REF  1              E4,1715          P21TIME   EQUALS DT/2    +2
A4092                                                                      B(2) TMP
R4093          INCORPORATION/VERB 83 COMMON STORAGE.                       (1D)

 4095  REF  1              E4,1717          EGRESS    EQUALS P21TIME +2    I(1)TMP SAVES RETURNS.
R4096          VERB 63 STORAGE.          MAY SHARE ONLY WITH INCORPORATION. (18D)

 4098  REF  1              E4,1720          RANGE     EQUALS EGRESS  +1    I(2)DSP NOUN 54 DISTANCE TO OPTICAL SUBJ
 4099  REF  1              E4,1722          RRATE     EQUALS RANGE   +2    I(2)DSP NOUN 54 RATE OF APPROACH
 4100  REF  1              E4,1724          RTHETA    EQUALS RRATE   +2    I(2)DSP NOUN 54
 4101  REF  1              E4,1726          RONE      EQUALS RTHETA  +2    I(6)TMP VECTOR STORAGE. (SCRATCH)
 4102  REF  1              E4,1734          VONE      EQUALS RONE    +6    I(8)TMP VECTOR STORAGE. (SCRATCH)
R4103          LUNAR LANDMARK SELECTION PROGRAM - R35                      (28D)

 4105  REF  2  LAST  66    E4,1720          XR1HOLD   EQUALS RANGE         I(2)
 4106  REF  1              E4,1722          VECTIME   EQUALS XR1HOLD +2    I(2)
 4107  REF  1              E4,1724          JLOOPCNT  EQUALS VECTIME +2    I(1)
 4108  REF  1              E4,1725          KLOOPCNT  EQUALS JLOOPCNT +1   I(1)
 4109  REF  1              E4,1726          NKVAL     EQUALS KLOOPCNT +1   I(1)
 4110  REF  1              E4,1727          DELTAL    EQUALS NKVAL   +1    I(2)
 4111  REF  1              E4,1731          TK        EQUALS DELTAL  +2    I(2)
 4112  REF  1              E4,1733          INDEXNUM  EQUALS TK      +2    I(1)

 4113  REF  1              E4,1734          LONGSAVE  EQUALS INDEXNUM +1   I(2)
 4114  REF  1              E4,1736          POSVECT   EQUALS LONGSAVE +2   I(6)
 4115  REF  1              E4,1744          VELVECT   EQUALS POSVECT  +6   I(8)
 4116  REF  1              E4,1752          LSLONG    EQUALS VELVECT  +8   I(2) TMP LONGITUDE OF LANDING SIGHT
R4117          S-BAND ANTENNA GIMBAL ANGLES.  DISPLAYED BY R05 (EXT.VB.64)
R4119                OPERATION DURING P00 ONLY.                            (4D)

 4120  REF  3  LAST  88    E4,1720          RHOSB     EQUALS RANGE         B(2)DSP NOUN 51.  PITCH ANGLE
 4121  REF  1              E4,1722          GAMMASB   EQUALS RHOSB   +2    B(2)DSP NOUN 51.  YAW ANGLE
R4122          R 36 SCRATCHPAD STORAGE                                     (12)
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 4124  REF  2  LAST  88  E4,1726          RPASS38  EQUALS RONE          I (8)S-S
 4125  REF  1            E4,1734          UNP36    EQUALS RPASS36 +6    I (8)S-S
A4126
R4127          EXTENDED VERB 82 STORAGE.

R4128          (*** THE SHARING IN THIS SECTION IS TEMPORARY ONLY****)   (8D)

 4130  REF  4  LAST  88  E4,1720          HPERMIN  EQUALS RANGE          I(2) SET TO 300KFT OR 35KFT FOR SR30.1
 4131  REF  1            E4,1722          RPADTEM  EQUALS HPERMIN +2     I(2) PAD OR LANDING RADIUS FOR SR30.1
 4132  REF  1            E4,1724          TSTART82 EQUALS RPADTEM +2     I(2) TEMP TIME STORAGE FOR V82.
A4133
R4134          MORE VERB 82 NOT SHARING WITH VERB 83                     (9D)
 4136  REF  1            E4,1742          V82FLAGS EQUALS VONE    +6      (1) FOR V 82 BITS
 4137  REF  1            E4,1743          TPP      EQUALS V82FLAGS +1     I(2) DSP NOUN 42,   , FOR P30,40,41.
 4138  REF  1            E4,1745          -TPER    EQUALS TPP      +2     I(2)DSP NOUN 32
 4139  REF  1            E4,1747          THETA(1) EQUALS -TPER    +2     I(2) TMP SET AT END OF V82
 4140  REF  1            E4,1755          RSP-RREC EQUALS AOPTIME         DSP NOUN R32
R4141          REENTRY CONICS                                            (8D)

 4143  REF  2  LAST  89  E4,1742          URONE    EQUALS V82FLAGS        I(8) SAVE ACTUAL FOR CALCULATIONS
A4144
R4145          V 82 DISPLAY                                              (4D)

 4147  REF  1            E4,1751          HAPOX    EQUALS THETA(1) +2     I(2) DSP NOUN 44
 4148  REF  1            E4,1753          HPERX    EQUALS HAPOX    +2     I(2) DSP NOUN 44
A4149

R4154          VARIOUS DISPLAY REGISTERS.                                (08D)

 4158  REF  1            E4,1755          AOPTIME  EQUALS HPERX    +2
 4157  REF  2  LAST  89  E4,1757          LANDLONG EQUALS AOPTIME  +2     I(2) DSP NOUN 89 FOR P22
 4158  REF  1            E4,1761          LANDALT  EQUALS LANDLONG +2     I(2)DSP NOUN 89 FOR P22.
R4159
R4160          S34/35.5,P34-P35 STORAGE.                                 (6D)

 4162  REF  1            E4,1763          KT       EQUALS LANDALT  +2     B(2)
 4163  REF  1            E4,1765          VERBNOUN EQUALS KT       +2     B(1)TMP
 4164  REF  1            E4,1766          OSAVED   EQUALS VERBNOUN +1     B(1)TMP HOLDS RETURN
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 4165  REF  1              E4,1767          RTRN     EQUALS QSAVED   +1    B(1) RETURN
 4166  REF  1              E4,1770          SUBEXIT  EQUALS RTRN     +1    B(1) TMP
A4167                                                                      RGEXIT CANT SHARE WITH HPER,HAPO
 4168  REF  1              E4,1770          RGEXIT   EQUALS SUBEXIT         I(1)TMP Q SAVE MODE 1 AND 2 TO RTRN MAIN
R4169          P 30 DISPLAY                                                (4D)

 4171  REF  2 LAST  89     E4,1763          HAPO     EQUALS KT              I(2) DSP NOUN 42, FOR P30.
 4172  REF  1              E4,1765          HPER     EQUALS HAPO     +2     I(2) DSP NOUN 42, FOR P30.
A4173
R4174          SOME P34 STORAGE.      (OVERLAYS P35.1 STORAGE)             (2D)

 4176  REF  3 LAST  90     E4,1763          NOMTPI   EQUALS KT              I(2)TMP NOMINAL TPI TIME FOR RECYCLE
R4177  THE FOLLOWING ARE ERASABLES USED BY THE SYSTEM TESTS. 205 USES TRANSM1  GS ARE NOT USED IN 205 NOR ARE THEY
R4179  WHILE 504 USES TRANSM1 AND ALFDK .

 4180                       E4,1400          TRANSM1  EQUALS 2000            (18) INITIALIZATION FOR IMU TESTS
 4181  REF  1              E4,1422          ALFDK    =      TRANSM1 +18D    (144) ERASABLE LOAD IN 504
R4182  END OF PERF. TEST ERASABLE IN BANK 4

R4183      *-*-* V82 *-*-*                                                  (6D)

 4185  REF  1              E4,1771          VONEα    EQUALS RGEXIT   +1     I(6)TMP NORMAL VELOCITY VONE/ SQ RT MU
A4186

R4167          PAD LOAD INTEGRATION ERROR INCLUDED IN VARIANCE BY P20       (1D)

 4188  REF  1              E4,1777          INTVAR   EQUALS VONEα    +6     I(1)PL  SQUARE OF EXPECTED INTEGRATION
A4189                                                                              POSITION EXTRAPOLATION ERROR.
A4190                                                                              SCALED METERS(2) 2(15)
 4191  REF  1              E4,1777          END-E4   EQUALS INTVAR          LAST USED ERASABLE IN E4
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P5000   EBANK=5 ASSIGNMENTS
 5001                    E5,1400                 SETLOC 2400
R5002          *-*-*-*-  OVERLAY 1 IN EBANK 5 -*-*-*-*

R5003          W-MATRIX STORAGE.                                        (162D)

 5005                    E5;1400          W      EQUALS 2400          B(162)

 5006   REF  1           E5,1570          EMATRIX =      W      +120D  B(42E   USED TO CONVERT W TO 6X6
 5007   REF  2  LAST 91  E5,1642          END-W  EQUALS W       +162D  **NEXT AVAILABLE LOC AFTER W MATRIX**
R5008          AUTO-OPTICS STORAGE -R52-

R5009   DO NOT MOVE FROM E5,1554. A DELICATE BALANCE EXISTS BETWEEN THIS AND P03
 5010   REF  3  LAST 91  E5,1554          XNB1   EQUALS W       +108D  B(6D) TMP
 5011   REF  1           E5,1562          YNB1   EQUALS XNB1    +6     B(6)TMP
 5012   REF  1           E5,1570          ZNB1   EQUALS YNB1    +6     B(6)TMP
 5013   REF  1           E5,1576          SAVQR52 EQUALS ZNB1   +6     I(2)TMP
 5014   REF  1           E5,1600          PLANVEC EQUALS SAVQR52 +2    B(6) S-S SIGHTING VECTOR IN REF. COOR.
 5015   REF  1           E5,1606          TSIGHT EQUALS PLANVEC +6     B(2) S-S TIME OF SIGHTING
A5016
R50165          RENDEZVOUS -P34-35                                      (28D)

 5016   REF  1           E5,1610          DVLOS  EQUALS TSIGHT  +2     I(6) S-S DELTA VELOCITY,LOS COORD-DISPL1
 5019   REF  1           E5,1610          DELTAR EQUALS DVLOS          I(2)
 5020   REF  1           E5,1610          TINTSOI EQUALS DELTAR        I(2) INTERCEPT TIME FOR  SOI MANEUVER
 50205  REF  2  LAST 91  E5,1612          DELTTIME EQUALS DVLOS +2     I(2)
 5021   REF  3  LAST 91  E5,1614          TARGTIME EQUALS DVLOS +4     I(2)
 5022   REF  4  LAST 91  E5,1616          UNRM   EQUALS DVLOS  +6     I(6) S-S
 5023   REF  1           E5,1624          ULOS   EQUALS UNRM   +6     I(6) S-S UNIT LINE OF SIGHT VECTOR
 5024   REF  1           E5,1632          ACTCENT EQUALS ULOS  +6     I(2) S-S CENTRAL ANGLE BETWEEN ACTIVE
A5025                                                                        VEH AT TPI IGNITION TIME AND
A5026                                                                        TARGET VECTOR.
 5027   REF  1           E5,1634          DELVTPI EQUALS ACTCENT +2    I(2)    NOUN 56 FOR P34.
 5026   REF  1           E5,1636          DELVTPF EQUALS DELVTPI +2    I(2)    NOUN 56,59 FOR P34,35.
 5029   REF  1           E5,1640          POSTTPI EQUALS DELVTPF +2    I(2)    NOUN 56 FOR P34.
 5030   REF  2  LAST 91  E5,1634          TDEC2  EQUALS DELVTPI        (2)
R5031          ALIGNMENT                                               (12D)

 5033   REF  5  LAST 91  E5,1610          STARSAV1 EQUALS DVLOS        I(6)TMP RESTART STAR SAVE.
 5034   REF  1           E5,1616          STARSAV2 EQUALS STARSAV1 +6  I(6)TMP RESTART STAR SAVE.
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5035  REP  1              E5,1616     US       =     STARSAV2          (CISLUNAR TAG FOR STARSAV2).
A5036
R5037           TPI SEARCH                                                (26D)

5039  REP  6  LAST  91    E5,1610     IT       EQUALS DVLOS             (6)
5040  REP  1              E5,1616     THETZERO EQUALS IT        +6      (2)
5041  REP  1              E5,1620     TPI      EQUALS THETZERO  +2      (2)
5042  REP  1              E5,1622     DELVEE   EQUALS TPI +2            (2)
5043  REP  1              E5,1624     HP       EQUALS DELVEE +2         (2)
5044  REP  1              E5,1626     TPO      EQUALS HP +2             (2)
5045  REP  1              E5,1630     HPO      EQUALS TPO +2            (2)
5046  REP  1              E5,1632     DELVEO   EQUALS HPO +2            (2)
5047  REP  1              E5,1634     MAGVTPI  EQUALS DELVEO    +2      I(2) TMP MAG OF DELTAVTPI OR VMID
5048  REP  1              E5,1636     RELDELV  EQUALS MAGVTPI   +2      I(2) TMP MAG OF DELTAVTPF
5049  REP  1              E5,1640     T3TOT4   EQUALS RELDELV   +2      I(2) DSP NOUN 39 FOR P34, 35. TPI TO TIN
A50491                                                                  T (CAN NOT SHARE WITH RETURN TO EARTH)
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P5050          ALIGNMENT/SYSTEST/CALCSMSC/CRS61.1 COMMON STORAGE.          (36D)
R5052          (CALCSMSC IS A SUBSET OF S41.1 AT LEAST)
R5053          (CRS61.1  IS A SUBSET OF P20)

 5054  REF  1            E5,1671          XSM     EQUALS END-W   +23D   B(8)
 5055  REF  1            E5,1677          YSM     EQUALS XSM     +8     B(8)TMP
 5056  REF  1            E5,1705          ZSM     EQUALS YSM     +8     B(8)TMP

 5057  REF  1            E5,1713          XDC     EQUALS ZSM     +8     B(8)TMP
 5058  REF  1            E5,1721          YDC     EQUALS XDC     +8     B(8)TMP
 5059  REF  1            E5,1727          ZDC     EQUALS YDC     +8     B(8)TMP

 5060  REF  2 LAST  93   E5,1713          XNB     =      XDC
 5061  REF  2 LAST  93   E5,1721          YNB     =      YDC
 5062  REF  1            E5,1727          ZNB     =      ZDC
R5063          OVERLAYS WITHIN ALIGNMENT/SYSTEST/CALCSMSC COMMON STORAGE.

 5064  REF  2 LAST  93   E5,1673          -COSB   EQUALS XSM     +2      (2)TMP
 5065  REF  1            E5,1675          SINB    EQUALS -COSB   +2      (2)TMP
R5066          ALIGNMENT/SYSTEST COMMON STORAGE.                          (18D)

 5068  REF  2 LAST  93   E5,1735          STARAD  EQUALS ZDC     +6     I(18D)TMP
R5069          ALIGNMENT/SYSTEST/AUTO OPTICS COMMON STORAGE.              (17D)

 5071  REF  1            E5,1757          CGC     EQUALS STARAD  +18D   I(2)TMP
 5072  REF  1            E5,1761          IGC     EQUALS CGC     +2     I(2)TMP
 5073  REF  1            E5,1763          MGC     EQUALS IGC     +2     I(2)TMP
 5074  REF  1            E5,1765          STAR    EQUALS MGC     +2     I(8)TMP
 5075  REF  1            E5,1773          SAC     EQUALS STAR    +8     I(2)TMP
 5076  REF  1            E5,1775          PAC     EQUALS SAC     +2     I(2)TMP
 5077  REF  1            E5,1777          OMIN    EQUALS PAC     +2     B(1)TMP
R5078

R5079          **** COLP50S ****                                          (1D)

 5081  REF  1            E5,1735          CULTRIX EQUALS VEARTH          VEARTH, VSUN, VMOON
R5082          OVERLAYS WITHIN ALIGNMENT/SYSTEST COMMON STORAGE.          (24D)

 5084  REF  2 LAST  93   E5,1735          VEARTH  EQUALS STARAD          (6)TMP
 5085  REF  2 LAST  93   E5,1743          VSUN    EQUALS VEARTH  +6      (6)TMP
 5086  REF  1            E5,1751          VMOON   EQUALS VSUN    +6      (6)TMP
 5087  REF  1            E5,1757          SAX     EQUALS VMOON   +6      (6)TMP
```

P5066 *-*-*-* OVERLAY 2 IN EBANK 5 -*-*-*-*

R5069 CONIC ROUTINES STORAGE. (67D)

5091	REF	2	LAST	93	E5,1642	DELX	EQUALS	END-W		I(2)TMP
5092	REF	1			E5,1644	DELT	EQUALS	DELX	+2	I(2)TMP
5093	REF	1			E5,1646	URRECT	EQUALS	DELT	+2	I(6)TMP
5094	REF	1			E5,1654	RCNORM	EQUALS	URRECT	+6	I(2)TMP
5095	REF	1			E3,1552	XPREV	EQUALS	XKEP		I(2)TMP
5096	REF	1			E5,1656	R_1VEC	EQUALS	RCNORM	+2	I(6)TMP
5097	REF	1			E5,1664	R_2VEC	EQUALS	R_1VEC	+6	I(6)TMP
5098	REF	1			E5,1672	TDESIRED	EQUALS	R_2VEC	+6	I(2)TMP
5099	REF	1			E5,1674	GEOMSGN	EQUALS	TDESIRED	+2	I(1)TMP
5100	REF	1			E5,1675	UN	EQUALS	GEOMSGN	+1	I(6)TMP
5101	REF	1			E5,1703	VTARGTAG	EQUALS	UN	+6	I(1)TMP
5102	REF	1			E5,1704	VTARGET	EQUALS	VTARGTAG	+1	I(6)TMP
5103	REF	1			E5,1712	RINLAMB	EQUALS	VTARGET	+6	I(1)TMP
5104	REF	1			E5,1713	U_2	EQUALS	RINLAMB	+1	I(6)TMP
5105	REF	1			E5,1721	$MAGVEC_2$	EQUALS	U_2	+6	I(2)TMP
5106	REF	1			E5,1723	UR_1	EQUALS	$MAGVEC_2$	+2	I(6)TMP
5107	REF	1			E5,1731	SNTH	EQUALS	UR_1	+6	I(2)TMP
5108	REF	1			E5,1733	CSTH	EQUALS	SNTH	+2	I(2)TMP
5109	REF	1			E5,1735	1-CSTH	EQUALS	CSTH	+2	I(2)TMP
5110	REF	1			E5,1737	CSTH-RHO	EQUALS	1-CSTH	+2	I(2)TMP
5111	REF	1			E5,1741	P	EQUALS	CSTH-RHO	+2	I(2)TMP
5112	REF	1			E5,1743	R_1A	EQUALS	P	+2	I(2)TMP
5113	REF	2	LAST	94	E5,1656	RVEC	EQUALS	R_1VEC		I(6)TMP
5114	REF	1			E5,1745	VVEC	EQUALS	R_1A	+2	I(6)TMP
5115	REF	2	LAST	94	E5,1712	RINTT	EQUALS	RINLAMB		I(1)TMP
5116	REF	1			E5,1753	ECC	EQUALS	VVEC	+6	I(2)TMP
5117	REF	3	LAST	94	E5,1712	RINTR	EQUALS	RINLAMB		I(1)TMP
5118	REF	4	LAST	94	E5,1712	RINAPSE	EQUALS	RINLAMB		I(1)TMP
5119	REF	2	LAST	94	E5,1721	R_2	EQUALS	$MAGVEC_2$		I(2)TMP
5120	REF	1			E5,1755	RINPRM	EQUALS	ECC	+2	I(1)TMP
5121	REF	1			E5,1756	SGNRDOT	EQUALS	RINPRM	+1	I(1)TMP
5122	REF	1			E5,1757	RDESIRED	EQUALS	SGNRDOT	+1	I(2)TMP
5123	REF	1			E5,1761	DELDEP	EQUALS	RDESIRED	+2	I(2)TMP
5124	REF	1			E5,1763	DEPREV	EQUALS	DELDEP	+2	I(2)TMP
5125	REF	2	LAST	94	E5,1761	TERRLAMB	EQUALS	DELDEP		I(2)TMP
5126	REF	1			E5,1763	TPREV	EQUALS	DEPREV		I(2)TMP
A5127										

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P5126           *-*-*-*-  OVERLAY 3 IN EBANK 5 -*-*-*-*

R5129           MEASUREMENT INCORPORATION STORAGE.                      (66D)
R5131           (CALLED BY P20, P22, P23)

 5132   REF  3  LAST  94   E5,1642         OMEGAM1  EQUALS END-W          I(6)TMP
 5133   REF  1             E5,1650         OMEGAM2  EQUALS OMEGAM1  +6    I(6)TMP
 5134   REF  1             E5,1656         OMEGAM3  EQUALS OMEGAM2  +6    I(6)TMP
 5135   REF  1             E5,1664         HOLDW    EQUALS OMEGAM3  +6    I(16)TMP
 5136   REF  1             E5,1706         TDPOS    EQUALS HOLDW    +18D  I(6)TMP
 5137   REF  1             E5,1714         TDVEL    EQUALS TDPOS    +6    I(6)TMP

 5136   REF  1             E5,1722         ZI       EQUALS TDVEL    +6    I(16)

R5140           P22-P23 STORAGE.                                        (8D)

 5143   REF  1             E5,1744         22SUBSCL EQUALS ZI       +18D  DE OF ABCDE LANDMARK ID NO.
 5144   REF  1             E5,1745         CXOFF    EQUALS 22SUBSCL +1    B OF ABCDE OFFSET INDICATOR
 5145   REF  1             E5,1746         BKK      EQUALS CXOFF    +1    B(1)TMP INDEX OF PRESENT MARK.
 5146   REF  1             E5,1747         BNN      EQUALS BKK      +1    B(1)TMP
 5147   REF  1             E5,1750         S22LOC   EQUALS BNN      +1    I(1)TMP MARK DATA LOC
 5148   REF  1             E5,1751         LANDMARK EQUALS S22LOC   +1    B(1)DSP NOUN 70 FOR P22,51, R52,53.
 5149   REF  1             E5,1752         HORIZON  EQUALS LANDMARK +1    B(1)DSP NOUN 70 FOR P22,51, R52,53.
 5150   REF  1             E5,1753         IDOFLMK  EQUALS HORIZON  +1    B(1)
R5151

R5152           ******P23***                                            (1D)
 5155   REF  1             E5,1754         TRUNION  EQUALS IDOFLMK  +1    B(1)
A5156
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P5157 *-*-*-*- OVERLAY 0 IN EBANK 5 -*-*-*-*

R5156 SYSTEM TEST STORAGE. (174)

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5160                        E5,1400  E5,1401  AZIMUTH  ERASE   +1
5161                        E5,1402  E5,1403  LATITUDE ERASE   +1

5162  REF  1                  1160             TRUNA    EQUALS DESOPTT
5163  REF  1                  1161             SHAFTA   EQUALS DESOPTS

5164                        E5,1404  E5,1411  ERVECTOR ERASE   +5
5165                        E5,1412  E5,1412  LENGTHOT ERASE
5166                        E5,1413  E5,1420  LOSVEC   ERASE   +5

5167  REF  1                E5,1413           SXTOPTN  =       LOSVEC
5168                        E5,1421  E5,1421  NDXCTR   ERASE
5169                        E5,1422  E5,1422  PIPINDEX ERASE
5170                        E5,1423  E5,1423  POSITON  ERASE
5171                        E5,1424  E5,1424  QPLAC    ERASE
5172                        E5,1425  E5,1425  QPLACE   ERASE
5173                        E5,1426  E5,1426  QPLACES  ERASE
5174                        E5,1427  E5,1427  RUN      ERASE
5175                        E5,1430  E5,1430  STOREPL  ERASE
5176                        E5,1431  E5,1431  SOUTHDR  ERASE
5177  REF  1                E5,1431           TARG1/2  =       SOUTHDR
5178                        E5,1432  E5,1437  TAZEL1   ERASE   +5
5179                        E5,1440  E5,1441  TEMPTIME ERASE   +1
5180                        E5,1442  E5,1443  TMARK    ERASE   +1
5181                        E5,1444  E5,1652  GENPL    ERASE   +134D
5182  REF  1                E5,1444           CDUTIMEI =       GENPL
5183  REF  2  LAST  96      E5,1446           CDUTIMEF =       GENPL +2
5184  REF  3  LAST  96      E5,1450           IMU/OPT  =       GENPL +4
5185  REF  4  LAST  96      E5,1451           CDUREADF =       GENPL +5
5186  REF  5  LAST  96      E5,1452           CDUREADI =       GENPL +6
5187  REF  6  LAST  96      E5,1453           CDULIMIT =       GENPL +7

5188  REF  7  LAST  96      E5,1450           TEMPADD  =       GENPL +4
5189  REF  8  LAST  96      E5,1451           TEMP     =       GENPL +5
5190  REF  9  LAST  96      E5,1452           NOBITS   =       GENPL +6
5191  REF 10  LAST  96      E5,1453           CHAN     =       GENPL +7

5192  REF 11  LAST  96      E5,1454           LOS1     =       GENPL +8D
5193  REF 12  LAST  96      E5,1462           LOS2     =       GENPL +14D

5194  REF 13  LAST  96      E5,1470           CALCDIR  EQUALS  GENPL +20D
5195  REF 14  LAST  96      E5,1471           CDUFLAG  EQUALS  GENPL +21D
5196  REF 15  LAST  96      E5,1472           GYTOBETO EQUALS  GENPL +22D
5197  REF 16  LAST  96      E5,1473           OPTNREG  EQUALS  GENPL +23D
5198  REF 17  LAST  96      E5,1474           SAVE     EQUALS  GENPL +24D   THREE CONSEC LOC
5199  REF 18  LAST  96      E5,1477           SPCONST1 EQUALS  GENPL +27D
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5200	REF	19	LAST	96	E5,1500	TIMER	EQUALS	GENPL +28D	
5201	REF	20	LAST	97	E5,1502	DATAPL	EQUALS	GENPL +30D	
5202	REF	21	LAST	97	E5,1444	RDSP	EQUALS	GENPL	FIX LATER POSSIBLY KEEP1
5203	REF	22	LAST	97	E5,1544	MASKREG	EQUALS	GENPL +64D	
5204	REF	23	LAST	97	E5,1546	CDUNDX	EQUALS	GENPL +66D	
5205	REF	24	LAST	97	E5,1547	RESULTCT	EQUALS	GENPL +67D	
5206	REF	25	LAST	97	E5,1552	COUNTPL	EQUALS	GENPL +70D	
5207	REF	26	LAST	97	E5,1553	CDUANG	EQUALS	GENPL +71D	
5208	REF	27	LAST	97	E5,1444	AINLA	=	GENPL	OPTIMUM CALIB. AND ALIGNMENT
5209	REF	1			E5,1444	WANGO	EQUALS	AINLA	
5210	REF	2	LAST	97	E5,1446	WANGI	EQUALS	AINLA +2D	
5211	REF	3	LAST	97	E5,1450	WANGT	EQUALS	AINLA +4D	
5212	REF	1			E5,1450	TORQNDX	=	WANGT	
5213	REF	4	LAST	97	E5,1452	DRIFTT	EQUALS	AINLA +6D	
5214	REF	5	LAST	97	E5,1454	ALX1S	EQUALS	AINLA +8D	
5215	REF	6	LAST	97	E5,1455	OMPX1	EQUALS	AINLA +9D	
5216	REF	7	LAST	97	E5,1456	ALK	EQUALS	AINLA +10D	
5217	REF	8	LAST	97	E5,1472	VLAUNS	EQUALS	AINLA +22D	
5218	REF	1			E5,1460	THETAX	=	ALK +2	
5219	REF	9	LAST	97	E5,1474	WPLATO	EQUALS	AINLA +24D	
5220	REF	10	LAST	97	E5,1500	INTY	EQUALS	AINLA +28D	
5221	REF	1			E5,1486	THETAN	=	THETAX +6	
5222	REF	11	LAST	97	E5,1502	ANGZ	EQUALS	AINLA +30D	
5223	REF	12	LAST	97	E5,1504	INTZ	EQUALS	AINLA +32D	
5224	REF	13	LAST	97	E5,1506	ANGY	EQUALS	AINLA +34D	
5225	REF	14	LAST	97	E5,1510	ANGX	EQUALS	AINLA +36D	
5226	REF	15	LAST	97	E5,1512	DRIFTO	EQUALS	AINLA +38D	
5227	REF	16	LAST	97	E5,1514	DRIFTI	EQUALS	AINLA +40D	
5228	REF	17	LAST	97	E5,1520	VLAUN	EQUALS	AINLA +44D	
5229	REF	1			E5,1474	PILDELV	=	THETAN +6	
5230	REF	18	LAST	97	E5,1522	ACCWD	EQUALS	AINLA +46D	
5231	REF	1			E5,1476	INTVEC	=	PILDELV +2	
5232	REF	19	LAST	97	E5,1530	POSNV	EQUALS	AINLA +52D	
5233	REF	20	LAST	97	E5,1532	DPIPAY	EQUALS	AINLA +54D	
5234	REF	21	LAST	97	E5,1536	DPIPAZ	EQUALS	AINLA +58D	
5235	REF	22	LAST	97	E5,1540	ALTIM	EQUALS	AINLA +60D	
5236	REF	23	LAST	97	E5,1541	ALTIMS	EQUALS	AINLA +61D	
5237	REF	24	LAST	97	E5,1542	ALDK	EQUALS	AINLA +62D	
5238	REF	25	LAST	97	E5,1560	DELM	EQUALS	AINLA +76D	
5239	REF	26	LAST	97	E5,1570	WPLATI	EQUALS	AINLA +84D	
5240	REF	27	LAST	97	E5,1577	RESTARPT	=	AINLA + 91D	
5241	REF	28	LAST	97	E5,1631	GEOSAVED	=	AINLA +117D	
5242	REF	29	LAST	97	E5,1632	PREMTRXC	=	AINLA +118D	
5243	REF	30	LAST	97	E5,1633	LAUNCHAZ	=	AINLA +119D	
5244	REF	31	LAST	97	E5,1635	NEWAZMTH	=	AINLA +121D	
5245	REF	32	LAST	97	E5,1637	OLDAZMTH	=	AINLA +123D	

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 5246  REF  33  LAST  97  E5,1641          TOLDAZMT =      AINLA +125D
 5247  REF  34  LAST  98  E5,1643          GEOCOMPS =      AINLA +127D
 5248  REF  35  LAST  98  E5,1644          1SECXT   =      AINLA +128D
 5249  REF  36  LAST  98  E5,1645          GTSWTLST =      AINLA +129D
 5250  REF  37  LAST  98  E5,1648          ERECTIME =      AINLA +130D
 5251  REF  38  LAST  98  E5,1647          ERCOMP   =      AINLA +131D
 5252  REF  39  LAST  98  E5,1655          ZERONDX  =      AINLA +137D
 5253  REF   1           E5,1655          GTSOPNDZ =      ZERONDX
R5254  THE FOLLOWING TAGS ARE USED BY THE 504 IMU CALIBRATION AND ALIGNMENT PROGRAM ONLY.

 5256  REF   2  LAST  97  E5,1480          THETAX1  EQUALS ALK      +2
 5257  REF   1           E5,1466          THETAN1  EQUALS THETAX1  +6
 5256  REF   1           E5,1474          FILDELV1 EQUALS THETAN1  +8
 5259  REF   1           E5,1476          INTVEC1  EQUALS FILDELV1 +2
 5260  REF  40  LAST  98  E5,1831          GEOSAVE1 EQUALS AINLA    +117D
 5261  REF  41  LAST  98  E5,1632          PREMTRX1 EQUALS AINLA    +118D
 5262  REF  42  LAST  98  E5,1633          LUNCHAZ1 EQUALS AINLA    +119D
 5263  REF   1           E5,1635          NEWAZ1   EQUALS LUNCHAZ1 +2
 5264  REF   2  LAST  96  E5,1837          OLDAZ1   EQUALS LUNCHAZ1 +4
 5265  REF   3  LAST  98  E5,1641          TOLDAZ1  EQUALS LUNCHAZ1 +8
 5266  REF  43  LAST  98  E5,1843          GEOCOMP1 EQUALS AINLA    +127D
 5267  REF  44  LAST  96  E5,1844          1SECXT1  EQUALS AINLA    +128D
 5268  REF  45  LAST  98  E5,1645          GTSWTLT1 EQUALS AINLA    +129D
 5269  REF  46  LAST  96  E5,1648          ERECTIM1 EQUALS AINLA    +130D
 5270  REF  47  LAST  96  E5,1647          ERCOMP1  EQUALS AINLA    +131D  I(6)
 5271  REF  48  LAST  96  E5,1655          ZERONDX1 EQUALS AINLA    +137D
 5271S REF  49  LAST  96  E5,1656          PERFDLAY EQUALS AINLA    +138D  B(2).....
R5272  END OF 504 CAL + ALIGN ERASE.
 5273  REF   1           E5,1777          END-E5   EQUALS QMIN           LAST USED E5 ADDRESS
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P6000                    EBANK=6 ASSIGNMENTS
 6001                        E6,1400                    SETLOC 3000

R60011          P23  PAD LOADS***                                        (2D).

 60013                      E6,1400  E6,1400   WMIDPOS  ERASE            I(1) PL  INITIAL VALUES FOR W-MATRIX IN
 60014                      E6,1401  E6,1401   WMIDVEL  ERASE            I(1) PL  CISLUNAR (P23) NAVIGATION
A60015
R60016          R22 PAD LOADS                                             ( 5D ).

 60018                      E6,1402  E6,1403   RVAR     ERASE      +1    I(2) PL  VHF RADAR
 60019                      E6,1404  E6,1406   RVARMIN  ERASE      +2    I(3) PL  VHF RADAR
A600195
R6002   ******** PAD LOADED ENTRY DAP STEERING VARIABLES ********         (3D)

 6004                       E6,1407  E6,1407   LADPAD   ERASE            I(1) PL  FOR ENTRY.HOLDS CM  NOMINAL L/D
 6005                       E6,1410  E6,1410   LODPAD   ERASE            I(1) PL  FOR ENTRY.HOLDS CM  NOMINAL LOD
 6006                       E6,1411  E6,1411   ALFAPAD  ERASE            B(1) PL  ALFA TRIM / 180
A60062

R6007   ******** PAD LOADED TVC DAP VARIABLES.**********************************(26D)

 6009                       E6,1412  E6,1412   ESTROKER ERASE                B(1)PL
 6010                       E6,1413  E6,1414   EKPRIME  ERASE          +1    B(2)PL
 6011                       E6,1415  E6,1415   ETDECAY  ERASE                I(1)PL
 6012                       E6,1416  E6,1417   EKTLX/I  ERASE  +1            B(2)PL
 6013                       E6,1420  E6,1420   ETVCDT/2 ERASE                B(1)PL
 6014                       E6,1421  E6,1421   ETSWITCH ERASE                B(1)PL
 6015                       E6,1422  E6,1422   ECORFRAC ERASE                B(1)PL
 6016                       E6,1423  E6,1424   EREPFRAC ERASE          +1    B(2)PL
 6017                       E6,1425  E6,1425   PACTOFF  ERASE                B(1)PL, DSP N48 R01 = PTRIM, R02 = YTRIM
 6018                       E6,1426  E6,1426   YACTOFF  ERASE                B(1)PL, CONSECUTIVE WITH PACTOFF
 6019                       E6,1427  E6,1427   AP0      ERASE                B(1)
 6020                       E6,1430  E6,1431   AP1      ERASE  +1            B(2)
 6021                       E6,1432  E6,1433   AP2      ERASE  +1            B(2)
 6022                       E6,1434  E6,1435   AP3      ERASE  +1            B(2)

 6023                       E6,1436  E6,1437   BP1      ERASE  +1            B(2)
 6024                       E6,1440  E6,1441   BP2      ERASE  +1            B(2)
 6025                       E6,1442  E6,1443   BP3      ERASE  +1            B(2)
 6027   REF  1              E6,1427            AY0      =      AP0
 6028   REF  1              E6,1430            AY1      =      AP1
 6029   REF  1              E6,1432            AY2      =      AP2
 6030   REF  1              E6,1434            AY3      =      AP3

 6031   REF  1              E6,1436            BY1      =      BP1
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 6032   REF  1          E6,1440          BY2      =      BP2
 6033   REF  1          E6,1442          BY3      =      BP3
R6034   ******** EXCLUSIVE TVC DAP VARIABLES. ********************************(5D)

 6036                   E6,1444  E6,1444 V97VCNTR ERASE                    B(1)
 6037                   E6,1445  E6,1446 TEMPDAP  ERASE  +1                B(2)
 6038   REF  1          E6,1445          MRKRTMP  =      TEMPDAP                ((B(1)))
 6039                   E6,1447  E6,1447 CNTR     ERASE                    B(1)
 6040                   E6,1450  E6,1450 OGAD     ERASE                    B(1)
A6041
R6042   ******** EXCLUSIVE RCS DAP VARIABLES.  ********************************(13D)

 6044                   E6,1451  E6,1465 RWORD1   ERASE          +12D      B(1)
 6045   REF  1          E6,1452          RWORD2   EQUALS RWORD1  +1        B(1)
 6046   REF  1          E6,1453          PWORD1   EQUALS RWORD2  +1        B(1)
 6047   REF  1          E6,1454          PWORD2   EQUALS PWORD1  +1        B(1)
 6048   REF  1          E6,1455          YWORD1   EQUALS PWORD2  +1        B(1)
 6049   REF  1          E6,1456          YWORD2   EQUALS YWORD1  +1        B(1)
 6050   REF  1          E6,1457          BLAST    EQUALS YWORD2  +1        B(2)
 6051   REF  1          E6,1461          BLAST1   EQUALS BLAST   +2        B(2)
 6052   REF  1          E6,1463          BLAST2   EQUALS BLAST1  +2        B(2)
60525   REF  1          E6,1465          T5PHASE  EQUALS BLAST2  +2        B(1)
A60526
R6053   ******** RCS/TVC DAP COMMON STORAGE.*********************************(16D)

 6055                   E6,1466  E6,1466 DAPDATR1 ERASE                    B(1)DSP NOUN 46(R1)
 6056                   E6,1467  E6,1467 DAPDATR2 ERASE                    B(1)DSP NOUN 46(R2)

 6057                   E6,1470  E6,1470 IXX      ERASE                    B(1) CONSECUTIVE WITH IAVG, IAVG/TLX FOR
 6058                   E6,1471  E6,1471 IAVG     ERASE                    B(1)                                MASSPROP
 6059                   E6,1472  E6,1472 IAVG/TLX ERASE                    B(1)

 6060                   E6,1473  E6,1474 LEMMASS  ERASE          +1        B(1) DSP NOUN 47 (R2)       LEM/CSMMASS
 6061   REF  1          E6,1474          CSMMASS  EQUALS LEMMASS +1        B(1) DSP NOUN 47 (R1)       FOR DOWNLINK
 6062                   E6,1475  E6,1475 WEIGHT/G ERASE                    B(1)
 6063   REF  1          E6,1475          MASS     =      WEIGHT/G

 6064                   E6,1476  E6,1476 AK       ERASE
 6065                   E6,1477  E6,1477 AK1      ERASE
 6066                   E6,1500  E6,1500 AK2      ERASE

 6067                   E6,1501  E6,1501 RCSFLAGS ERASE                    B(1) CONSECUTIVE WITHAK2 DOWNLINK
 6068                   E6,1502  E6,1502 T5TEMP   ERASE                    B(1)
 6069                   E6,1503  E6,1503 EDRIVEX  ERASE
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 6070                    E6,1504  E6,1504   EDRIVEY  ERASE
 6071                    E6,1505  E6,1505   EDRIVEZ  ERASE
R6072          INTEMP THRU INTEMP+14D  ARE RESERVED FOR OVERLAYED TVC/RCS INTERUP TRUE TEMPORIES
 6074                    E6,1506  E6,1524   INTTEMP  ERASE          +14D    (15)
R6075          TVC/RCS THRU TVCRCS +11D RESERVED FOR DOWNLINKED VARIABLES

 6076                    E6,1525  E6,1540   TVCRCS   ERASE          +11D    (12)
A6077                                                                      RCS (WBODYS,ADOTS)
A6078                                                                      TVC(OMEGACS,OMEGABS)
R6079          TVC DAP TEMPORARY VARIABLES**************************************

R6080          TVC DAP INTERUPT TRUE TEMPORARIES*********************************

 6081  REF  1           E6,1506          PHI333   EQUALS INTTEMP          B(1)     TEMPORARY REGISTER
 6082  REF  1           E6,1507          PSI333   EQUALS PHI333   +1      B(1)     COUNTING REGISTER
 6083  REF  1           E6,1510          TEMP333  EQUALS PSI333   +1      B(1)     COUNTING REGISTER
 6084  REF  1           E6,1511          VARST0   EQUALS TEMP333  +1      B(10D)   BREAKPOINTS AND SLOPES
 6085  REF  1           E6,1516          VARST5   =      VARST0   +5
 6085I REF  2 LAST 10I  E6,1522          LASTMASP EQUALS VARST0   +9D     LAST VARST0 WORD
 6085Z REF  1           E6,1523          TVCTMP1  EQUALS LASTMASP +1      B(1)
A6086
R6087          ********REGULAR TVC TEMPORARIES*************
R6086          TVC ZEROING LOOP STARTS AT OMEGAYC                         (70D)
 6090  REF  1           E6,1525          OMEGAC   EQUALS TVCRCS           I(6)
 6091  REF  1           E6,1525          OMEGAXC  =      OMEGAC
 6092  REF  2 LAST 101  E6,1527          OMEGAYC  =      OMEGAC   +2
 6093  REF  3 LAST 101  E6,1531          OMEGAZC  =      OMEGAC   +4

 6094  REF  2 LAST 10I  E6,1533          OMEGAB   EQUALS TVCRCS   +6      B(6)
 6095  REF  1           E6,1533          OMEGAXB  =      OMEGAB
 6096  REF  2 LAST 10I  E6,1535          OMEGAYB  =      OMEGAB +2
 6097  REF  3 LAST 101  E6,1537          OMEGAZB  =      OMEGAB +4

 6098  REF  4 LAST 101  E6,1541          PNSUM    EQUALS OMEGAC   +12D    B(2)
 6099  REF  I           E6,1543          PDSUM    EQUALS PNSUM +2         B(2)

 6100  REF  1           E6,1545          B1       EQUALS PDSUM +2         B(1)
 6101  REF  1           E6,1546          B2       EQUALS B1 +1            B(1)
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6102	REF	1	E6,1547	B_3	EQUALS B_2 +1	B(1)	
6103	REF	1	E6,1550	B_4	EQUALS B_3 +1	B(1)	
6104	REF	1	E6,1551	B_5	EQUALS B_4 +1	B(1)	
6105	REF	1	E6,1552	B_6	EQUALS B_5 +1	B(1)	
6106	REF	1	E6,1553	J_1	EQUALS B_6 +1	B(2)	
6107	REF	1	E6,1555	J_2	EQUALS J_1 +2	B(2)	
6108	REF	1	E6,1557	J_3	EQUALS J_2 +2	B(2)	
6109	REF	1	E6,1561	J_4	EQUALS J_3 +2	B(2)	
6110	REF	1	E6,1563	J_5	EQUALS J_4 +2	B(2)	
6111	REF	1	E6,1565	YNSUM	EQUALS J_5 +2	B(2)	
6112	REF	1	E6,1567	YDSUM	EQUALS YNSUM +2	B(2)	
6113	REF	1	E6,1571	C_1	EQUALS YDSUM +2	B(1)	
6114	REF	1	E6,1572	C_2	EQUALS C_1 +1	B(1)	
6115	REF	1	E6,1573	C_3	EQUALS C_2 +1	B(1)	
6116	REF	1	E6,1574	C_4	EQUALS C_3 +1	B(1)	
6117	REF	1	E6,1575	C_5	EQUALS C_4 +1	B(1)	
6118	REF	1	E6,1576	C_6	EQUALS C_5 +1	B(1)	
6119	REF	1	E6,1577	Y_1	EQUALS C_6 +1	B(2)	
6120	REF	1	E6,1601	Y_2	EQUALS Y_1 +2	B(2)	
6121	REF	1	E6,1603	Y_3	EQUALS Y_2 +2	B(2)	
6122	REF	1	E6,1605	Y_4	EQUALS Y_3 +2	B(2)	
6123	REF	1	E6,1607	Y_5	EQUALS Y_4 +2	B(2)	
6124	REF	1	E6,1611	ROLLPIRE	EQUALS Y_5 +2	B(1)	
6125	REF	1	E6,1612	ROLLWORD	EQUALS ROLLPIRE +1	B(1)	
6126	REF	1	E6,1613	TEMREG	EQUALS ROLLWORD +1	B(1)	
6127	REF	1	E6,1614	STROKER	EQUALS TEMREG +1	B(1)	
6129	REF	1	E6,1615	PERRB	EQUALS STROKER +1	B(2)	
6130	REF	1	E6,1617	YERRB	EQUALS PERRB +2	B(2)	
6131	REF	1	E6,1621	DELPBAR	EQUALS YERRB +2	B(2)	
6132	REF	1	E6,1623	DELYBAR	EQUALS DELPBAR +2	B(2)	
6133	REF	1	E6,1625	PDELOFF	EQUALS DELYBAR +2	B(2)	
6134	REF	1	E6,1627	YDELOFF	EQUALS PDELOFF +2	B(2)	
R6135			TVC ZEROING LOOP ENDS HERE				
6136	REF	1	E6,1631	PCMD	EQUALS YDELOFF +2	B(1)	
6137	REF	1	E6,1632	YCMD	EQUALS PCMD +1	B(1),	CONSECUTIVE WITH PCMD
6138	REF	1	E6,1633	TACTOFF	EQUALS YCMD +1	B(2)	
6139	REF	1	E6,1635	T5TVCDT	EQUALS TACTOFF +2	B(1)	
6140	REF	1	E6,1636	MDT	EQUALS T5TVCDT +1	I(6)	

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 6141  REF  1            E6,1644          KPRIMEDT EQUALS MDT      +6    I(2)
 6142  REF  1            E6,1646          KTLX/I   EQUALS KPRIMEDT +2    B(1)
 6143  REF  1            E6,1647          TENMDOT  EQUALS KTLX/I   +1    B(1)
 6144  REF  1            E6,1650          1/CONACC EQUALS TENMDOT  +1    B(1)
 6145  REF  1            E6,1651          VARK     EQUALS 1/CONACC +1    B(1)
 6146  REF  1            E6,1652          REPFRAC  EQUALS VARK     +1    B(1)
 6147  REF  1            E6,1653          VCNTR    EQUALS REPFRAC  +1    B(1)
 6147? REF  1            E6,1654          TVCPHASE EQUALS VCNTR    +1    B(1)
 6146  REF  1            E6,1655          PCDUYPST EQUALS TVCPHASE +1    B(1)
 6149  REF  1            E6,1656          PCDUZPST EQUALS PCDUYPST +1    B(1)
 6150  REF  1            E6,1657          MCDUYDOT EQUALS PCDUZPST +1    B(1)
 6151  REF  1            E6,1660          MCDUZDOT EQUALS MCDUYDOT +1    B(1)
 6152  REF  1            E6,1661          TVCEXPHS EQUALS MCDUZDOT +1    B(1)
 6153  REF  1            E6,1662          MASSTMP  EQUALS TVCEXPHS +1    B(1)    PROTECT
 6154  REF  1            E6,1663          VCNTRTMP EQUALS MASSTMP  +1    B(1)      *PROTECT***

R6155                STROKE TEST VARIABLES

R6156  (6D)
 6157  REF  1            E6,1664          STRKTIME EQUALS VCNTRTMP +1    B(1)
 6158  REF  1            E6,1665          CADDY    EQUALS STRKTIME +1    B(1)
 6159  REF  1            E6,1666          N        EQUALS CADDY    +1    B(1)
 6160  REF  1            E6,1667          BUNKER   EQUALS N        +1    B(1)
 6161  REF  1            E6,1670          REVS     EQUALS BUNKER   +1    B(1)
 6162  REF  1            E6,1671          CARD     EQUALS REVS     +1    B(1)

R6163                TVC ROLL DAP VARIABLES

R6164  (8D)
 6165  REF  1.           E6,1672          OGANOW   EQUALS CARD     +1    B(1)
 6166  REF  1            E6,1673          OGAPAST  EQUALS OGANOW   +1    B(1)
 6167  REF  1            E6,1674          OGA      EQUALS OGAPAST  +1    B(1)TMP
 6166  REF  1            E6,1674          OGAERR   =      OGA             (ROLL DAP USES OGA, MEANS OGAERROR)
 6169  REF  2  LAST 103  E6,1675          DELOGART EQUALS OGA      +1    B(1)TMP
 6170  REF  1            E6,1676          SGNRT    EQUALS DELOGART +1    SIGN OF OGA RATE
 6171  REF  1            E6,1677          DELOGA   EQUALS SGNRT    +1    USED IN ROLL LOGIC
 6172  REF  1            E6,1700          I        EQUALS DELOGA   +1    USED IN ROLL LOGIC
 6173  REF  1            E6,1701          IOGARATE EQUALS I        +1    USED IN ROLL LOGIC

R6174                TVC DAP RESTART TEMPORARIES.                        (33D)

 6176  REF  1            E6,1702          TKTLX/I  EQUALS IOGARATE +1    B(1)
 6177  REF  1            E6,1703          PACTIMP  EQUALS TKTLX/I  +1    B(2)
 6176  REF  1            E6,1705          YACTIMP  EQUALS PACTIMP  +2    B(2)
 6179  REF  1            E6,1707          CNTRIMP  EQUALS YACTIMP  +2    B(1)
 6180  REF  1            E6,1710          STRKTIMP EQUALS CNTRIMP  +1    B(1)
 6161  REF  1            E6,1711          NSUMTMP  EQUALS STRKTIMP +1    B(2)
 6182  REF  1            E6,1713          DSUMTMP  EQUALS NSUMTMP  +2    B(2)
 6183  REF  1            E6,1715          DELBRTMP EQUALS DSUMTMP  +2    B(2)
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6184	REF	1		E6,1717	B_1TMP	EQUALS	DELBRTMP +2	B(1)
6185	REF	1		E6,1720	B_2TMP	EQUALS	B_1TMP +1	B(1)
6186	REF	1		E6,1721	B_3TMP	EQUALS	B_2TMP +1	B(1)
6187	REF	1		E6,1722	B_4TMP	EQUALS	B_3TMP +1	B(1)
6188	REF	1		E6,1723	B_5TMP	EQUALS	B_4TMP +1	B(1)
6189	REF	1		E6,1724	B_6TMP	EQUALS	B_5TMP +1	B(1)
6190	REF	1		E6,1725	B_7TMP	EQUALS	B_6TMP +1	B(1)
6191	REF	1		E6,1726	J_1TMP	EQUALS	B_7TMP +1	B(2)
6192	REF	1		E6,1730	J_2TMP	EQUALS	J_1TMP +2	B(2)
6193	REF	1		E6,1732	J_3TMP	EQUALS	J_2TMP +2	B(2)
6194	REF	1		E6,1734	J_4TMP	EQUALS	J_3TMP +2	B(2)
6195	REF	1		E6,1736	J_5TMP	EQUALS	J_4TMP +2	B(2)
6196	REF	1		E6,1740	J_6TMP	EQUALS	J_5TMP +2	B(2)
6197	REF	1		E6,1742	ERRBTMP	EQUALS	J_6TMP +2	B(2)
6198	REF	1		E6,1744	CMDTMP	EQUALS	ERRBTMP +2	B(2)
6199			OVERLAYS WITHIN TVC DAP					
6200	REF	4	LAST 101	E6,1533	OGARATE	=	OMEGAB	B(2)
6201	REF	2	LAST 104	E6,1742	B_2ZERO	=	ERRBTMP	
6202	REF	3	LAST 104	E6,1742	C_2ZERO	=	ERRBTMP	
6203	REF	1		E6,1744	J_2ZERO	=	CMDTMP	
6204	REF	2	LAST 104	E6,1744	Y_2ZERO	=	CMDTMP	
6205	REF	2	LAST 103	E6,1651	KPGEN3	=	VARK	
6206	REF	1		E6,1651	KYGEN3	=	KPGEN3	
6207	REF	4	LAST 104	E6,1742	EP	=	ERRBTMP	
6208	REF	3	LAST 104	E6,1744	NPD	=	CMDTMP	
6209	REF	2	LAST 102	E6,1561	NP0	EQUALS	J_4	(B(2))
6210	REF	2	LAST 102	E6,1563	NP1	EQUALS	J_5	(B(2))
6211	REF	2	LAST 101	E6,1541	NP2	EQUALS	PNSUM	(B(2))
6212	REF	2	LAST 101	E6,1543	NP3	EQUALS	PDSUM	(B(2))
6213	REF	2	LAST 104	E6,1736	NP1TMP	EQUALS	J_5TMP	(B(2))
6214	REF	2	LAST 103	E6,1711	NP2TMP	EQUALS	NSUMTMP	(B(2))
6215	REF	2	LAST 103	E6,1713	NP3TMP	EQUALS	DSUMTMP	(B(2))
6216	REF	5	LAST 104	E6,1742	EY	=	ERRBTMP	
6217	REF	4	LAST 104	E6,1744	NYD	=	CMDTMP	
6218	REF	2	LAST 102	E6,1605	NY0	EQUALS	Y_4	(B(2))
6219	REF	2	LAST 102	E6,1607	NY1	EQUALS	Y_5	(B(2))
6220	REF	2	LAST 102	E6,1565	NY2	EQUALS	YNSUM	(B(2))
6221	REF	2	LAST 102	E6,1567	NY3	EQUALS	YDSUM	(B(2))
6222	REF	1		E6,1736	NY1TMP	EQUALS	Y_5TMP	(B(2))
6223	REF	3	LAST 104	E6,1711	NY2TMP	EQUALS	NSUMTMP	(B(2))
6224	REF	3	LAST 104	E6,1713	NY3TMP	EQUALS	DSUMTMP	(B(2))

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 6225  REP  2  LAST  104  E6,1717   C1TMP  =  B1TMP   (B(1))
 6226  REP  2  LAST  104  E6,1720   C2TMP  =  B2TMP   (B(1))
 6227  REP  2  LAST  104  E6,1721   C3TMP  =  B3TMP   (B(1))
 6228  REP  2  LAST  104  E6,1722   C4TMP  =  B4TMP   (B(1))
 6229  REP  2  LAST  104  E6,1723   C5TMP  =  B5TMP   (B(1))
 6230  REP  2  LAST  104  E6,1724   C6TMP  =  B6TMP   (B(1))
 6231  REP  2  LAST  104  E6,1725   C7TMP  =  B7TMP   (B(1))

 6232  REP  2  LAST  104  E6,1728   Y1TMP  =  J1TMP   (B(2))
 6233  REP  2  LAST  104  E6,1730   Y2TMP  =  J2TMP   (B(2))
 6234  REP  2  LAST  104  E6,1732   Y3TMP  =  J3TMP   (B(2))
 6235  REP  2  LAST  104  E6,1734   Y4TMP  =  J4TMP   (B(2))
 6236  REP  3  LAST  104  E6,1736   Y5TMP  =  J5TMP   (B(2))
 6237  REP  2  LAST  104  E6,1740   Y6TMP  =  J6TMP   (B(2))
R62371

R62372          S40.9 STORAGE.....

 62373  REP  5  LAST  104  E6,1746   NBRCYCLS EQUALS CMDTMP   +2   B(1)   COUNTER FOR P40,41 STEERING
 62374  REP  1              E6,1747   NBRCYCLP EQUALS NBRCYCLS +1   B(1) MAINTAIN ORDER
 62375  REP  1              E6,1750   DELVSUM  EQUALS NBRCYCLP +1   I(6)  P40,P41
 62376  REP  1              E6,1756   DELVSUMP EQUALS DELVSUM  +6   I(6)  P40,P41
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P6238   ******** RCS DAP TEMPORARY VARIABLES.**********************************(95D)

R6240           **RCS INTERUPT TRUE TEMPS************************              15D

 6242   REF  2  LAST  101   E6,1508        SPNDX    EQUALS INTTEMP          B(1)
 6243   REF  1              E6,1507        DPNDX    EQUALS SPNDX    +1      B(1)TMP
 6244   REF  1              E6,1510        KMPAC    EQUALS DPNDX    +1      B(2)TMP
 6245   REF  1              E6,1512        KMPTEMP  EQUALS KMPAC    +2      B(1)TMP

 6248   REF  1              E6,1513        XNDX1    EQUALS KMPTEMP  +1      B(1)TMP  XNDX1 THRU NYJETS ARE OVERLAYED
 6247   REF  1              E6,1514        XNDX2    EQUALS XNDX1    +1      B(1)TMP  BY OTHER DAP ERASABLES SO
 6248   REF  1              E6,1515        YNDX     EQUALS XNDX2    +1      B(1)TMP  SHOULD ALWAYS BE DEFINED IN
 6249   REF  1              E6,1516        ZNDX     EQUALS YNDX     +1      B(1)TMP  A BLOCK
 6250   REF  1              E6,1517        RINDEX   EQUALS ZNDX     +1      B(1)TMP
 6251   REF  1              E6,1520        PINDEX   EQUALS RINDEX   +1      B(1)TMP
 6252   REF  1              E6,1521        YINDEX   EQUALS PINDEX   +1      B(1)TMP
 6253   REF  1              E6,1522        NRJETS   EQUALS YINDEX   +1      B(1)TMP
 6254   REF  1              E6,1523        NPJETS   EQUALS NRJETS   +1      B(1)TMP
 6255   REF  1              E6,1524        NYJETS   EQUALS NPJETS   +1      B(1)TMP

 6256   REF  2  LAST  108   E6,1513        WTEMP    EQUALS XNDX1            B(2)TMP  WTEMP THRU DELTEMPZ OVERLAY
 6257   REF  1              E6,1515        DELTEMPX EQUALS WTEMP    +2      B(2)TMP  XNDX1 THRU NRJETS AND EDOT THRU
 6258   REF  1              E6,1517        DELTEMPY EQUALS DELTEMPX +2      B(2)TMP  ADBVEL
 6259   REF  1              E6,1521        DELTEMPZ EQUALS DELTEMPY +2      B(2)TMP

 6280   REF  2  LAST  106   E6,1515        EDOT     EQUALS YNDX             B(2)TMP  EDOT THRU ADBVEL OVERLAY
 6281   REF  1              E6,1517        AERR     EQUALS EDOT     +2      B(1)TMP  YNDX THRU NPJETS AND DELTEMPX
 6262   REF  1              E6,1520        EDOTVEL  EQUALS AERR     +1      B(2)TMP   THRU DELTEMPZ
 6263   REF  1              E6,1522        AERRVEL  EQUALS EDOTVEL  +2      B(1)TMP
 6284   REF  1              E6,1523        ADBVEL   EQUALS AERRVEL  +1      B(1)TMP

R6265           *** REGULAR RCS TEMPS*****************************              (  ).

R6267           RCS ZEROING LOOP STARTS HERE****  ** **  **  ***  *** * *     (37)

 6269   REF  3  LAST  101   E6,1525        WBODY    EQUALS TVCRCS           B(2)TMP
 6270   REF  1              E6,1527        WBODY1   EQUALS WBODY    +2      B(2)TMP
 6271   REF  2  LAST  106   E6,1531        WBODY2   EQUALS WBODY    +4      B(2)TMP
 6272   REF  1              E6,1533        ADOT     EQUALS WBODY2   +2      B(2)TMP
 6273   REF  1              E6,1535        ADOT1    EQUALS ADOT     +2      B(2)TMP
 6274   REF  1              E6,1537        ADOT2    EQUALS ADOT1    +2      B(2)TMP

 6278   REF  1              E6,1541        MERRORX  EQUALS ADOT2    +2       (2)
 6279   REF  1              E6,1543        MERRORY  EQUALS MERRORX  +2       (2)
 6280   REF  1              E6,1545        MERRORZ  EQUALS MERRORY  +2       (2)
 6281   REF  1              E6,1547        DFT      EQUALS MERRORZ +2              B(1)TMP
 6282   REF  1              E6,1550        DFT1     EQUALS DFT      +1      B(1)TMP
 6283   REF  1              E6,1551        DFT2     EQUALS DFT1     +1      B(1)TMP
 6284   REF  1              E6,1552        DRHO     EQUALS DFT2     +1      B(2)TMP
 6285   REF  1              E6,1554        DRHO1    EQUALS DRHO     +2      B(2)TMP
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6286	REF	1	E8,1558	DRHO2	EQUALS	DRHO1 +2	B(2)TMP
6287	REF	1	E8,1580	ATTSEC	EQUALS	DRHO2 +2	B(1)TMP
6288	REF	1	E6,1561	TAU	EQUALS	ATTSEC +1	B(1)TMP
6289	REF	1	E8,1582	TAU1	EQUALS	TAU +1	B(1)TMP
6290	REF	1	E6,1563	TAU2	EQUALS	TAU1 +1	B(1)TMP
6291	REF	1	E8,1584	BIAS	EQUALS	TAU2 +1	B(1)TMP
6292	REF	1	E8,1585	BIAS1	EQUALS	BIAS +1	B(1)TMP
6293	REF	1	E6,1586	BIAS2	EQUALS	BIAS1 +1	B(1)TMP
62931	REF	1	E6,1587	ERRORX	EQUALS	BIAS2 +1	B(1)TMP
62932	REF	1	E8,1570	ERRORY	EQUALS	ERRORX +1	B(1)TMP
62933	REF	1	E6,1571	ERRORZ	EQUALS	ERRORY +1	B(1)TMP
A6294							
R6295			RCS ZERO LOOP ENDS HERE				
R6298			MORE RCS				(89D)
6300	REF	1	E8,1572	THETADX	EQUALS	ERRORZ +1	B(1)TMP MUST BE CONSECUTIVE WITH ERRORZ
6301	REF	1	E6,1573	THETADY	EQUALS	THETADX +1	B(1)TMP
6302	REF	1	E6,1574	THETADZ	EQUALS	THETADY +1	B(1)TMP
6303	REF	1	E6,1575	DELCDUX	EQUALS	THETADZ +1	B(2)TMP
6304	REF	1	E8,1577	DELCDUY	EQUALS	DELCDUX +2	B(2)TMP
6305	REF	1	E6,1801	DELCDUZ	EQUALS	DELCDUY +2	B(2)TMP
6306	REF	1	E6,1803	DCDU	EQUALS	DELCDUZ +2	B(8)TMP USED DURING P20
63085	REF	1	E6,1811	DTHETASM	EQUALS	DCDU +8	B(8)TMP STEER LOW OUTPUT.
6307	REF	1	E6,1817	ATTKALMN	EQUALS	DTHETASM +8	B(1)TMP
6308	REF	1	E6,1820	KMJ	EQUALS	ATTKALMN +1	B(1)TMP
6309	REF	1	E6,1621	KMJ1	EQUALS	KMJ +1	B(1)TMP
6310	REF	1	E6,1822	KMJ2	EQUALS	KMJ1 +1	B(1)TMP
6311	REF	1	E6,1623	J/M	EQUALS	KMJ2 +1	B(1)TMP
6312	REF	1	E6,1824	J/M1	EQUALS	J/M +1	B(1)TMP
6313	REF	1	E6,1625	J/M2	EQUALS	J/M1 +1	B(1)TMP
6314	REF	1	E6,1828	RACFAIL	EQUALS	J/M2 +1	B(1)TMP
6315	REF	1	E6,1627	RBDFAIL	EQUALS	RACFAIL +1	B(1)TMP
6316	REF	1	E6,1830	ACORBD	EQUALS	RBDFAIL +1	B(1)TMP
6317	REF	1	E6,1631	XTRANS	EQUALS	ACORBD +1	B(1)TMP
6318	REF	1	E6,1632	CH31TEMP	EQUALS	XTRANS +1	B(1)TMP
6319	REF	1	E6,1833	CHANTEMP	EQUALS	CH31TEMP +1	B(1)TMP
6320	REF	1	E6,1834	T5TIME	EQUALS	CHANTEMP +1	B(1)TMP
6321	REF	1	E6,1635	RHO	EQUALS	T5TIME +1	B(1)TMP
6322	REF	1	E6,1838	RHO1	EQUALS	RHO +1	B(1)TMP
6323	REF	1	E6,1637	RHO2	EQUALS	RHO1 +1	B(1)TMP
6324	REF	1	E6,1840	AMGB1	EQUALS	RHO2 +1	B(1)TMP
6325	REF	1	E6,1841	AMGB4	EQUALS	AMGB1 +1	B(1)TMP

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6326	REF	1	E6,1642	AMGB5	EQUALS AMGB4	+1	B(1)TMP
6327	REF	1	E6,1643	AMGB7	EQUALS AMGB5	+1	B(1)TMP
6328	REF	1	E6,1644	AMGB6	EQUALS AMGB7	+1	B(1)TMP
6329	REF	1	E6,1645	CAPSI	EQUALS AMGB6	+1	B(1)TMP
6330	REF	1	E6,1646	CDUXD	EQUALS CAPSI	+1	B(2)TMP
6331	REF	1	E6,1650	CDUYD	EQUALS CDUXD	+2	B(2)TMP
6332	REF	1	E6,1652	CDUZD	EQUALS CDUYD	+2	B(2)TMP
6333	REF	1	E6,1654	SLOPE	EQUALS CDUZD	+2	B(1)TMP
6334	REF	1	E6,1655	ADB	EQUALS SLOPE	+1	B(1)TMP
6335	REF	1	E6,1656	RMANNDX	EQUALS ADB	+1	B(1)TMP
6336	REF	1	E6,1657	PMANNDX	EQUALS RMANNDX	+1	B(1)TMP
6337	REF	1	E6,1660	YMANNDX	EQUALS PMANNDX	+1	B(1)TMP MUST BE LAST VARIABLE IN RCS

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P6338   ********  ENTRY DAP TEMPORARY VARIABLES.**********************************(69D)

R6340   ANGLE REGISTERS FOR ENTRY DAPS

 6341   REP  1          E6,1661      ACG       EQUALS BCDU          1P
 6342   REP  1          E6,1662      AIG       EQUALS ACG +1        1P
 6343   REP  1          E6,1663      AMG       EQUALS AIG +1        1P
 6344   REP  1          E6,1664      ROLL/160  EQUALS AMG    +1     1P
 6345   REP  1          E6,1665      ALPA/160  EQUALS ROLL/160 +1   1P
 6346   REP  1          E6,1666      BETA/160  EQUALS ALPA/160 +1   1P
 6347   REP  1          E6,1667      ACG/PIP   EQUALS BETA/160 +1   1P
 6348   REP  1          E6,1670      AIG/PIP   EQUALS ACG/PIP  +1   1P
 6349   REP  1          E6,1671      AMG/PIP   EQUALS AIG/PIP  +1   1P
 6350   REP  1          E6,1672      ROLL/PIP  EQUALS AMG/PIP  +1   1P
 6351   REP  1          E6,1673      ALPA/PIP  EQUALS ROLL/PIP +1   1P
 6352   REP  1          E6,1674      BETA/PIP  EQUALS ALPA/PIP +1   1P

R6353   GYMBAL DIFFERENCES OVER INTERVAL TCDU = .1 SEC.

 6354   REP  1          E6,1675      -DELACG   EQUALS BETA/PIP +1   1P
 6355   REP  1          E6,1676      -DELAIG   EQUALS -DELACG +1    1P
 6356   REP  1          E6,1677      -DELAMG   EQUALS -DELAIG +1    1P

R6359   ESTIMATED BODY RATES

 63591  REP  1          E6,1700      CMDAPMOD  EQUALS -DELAMG +1    1P  GOES BEFORE PREL FOR TM.

 6360   REP  1          E6,1701      PREL      EQUALS CMDAPMOD +1   1P  P TCDU/160      (ROLLDOT)
 6361   REP  1          E6,1702      QREL      EQUALS PREL +1       1P  Q TCDU/160      (PITCHDOT)
 6362   REP  1          E6,1703      RREL      EQUALS QREL +1       1P  R TCDU/160      (YAWDOT)

 6363   REP  1          E6,1704      BETADOT   EQUALS RREL    +1    1P  MUST FOLLOW RREL. BETADOT TCDU/180
 6364   REP  1          E6,1705      PHIDOT    EQUALS BETADOT +1    1P

R6365   OLD (UNAVERAGED) BODY RATE MEASURE

 6366   REP  1          E6,1706      OLDELP    EQUALS PHIDOT  +1    1P
 6367   REP  1          E6,1707      OLDELQ    EQUALS OLDELP +1     1P
 6368   REP  1          E6,1710      OLDELR    EQUALS OLDELQ +1     1P

 6372   REP  1          E6,1711      JETAG     EQUALS OLDELR  +1    1P
 6373   REP  1          E6,1712      TUSED     EQUALS JETAG +1      1P  ELAPSED TIME SINCE NOMINAL UPDATE.
A63731

R6374           FOLLOWING 3 SP WORDS IN DOWNLINK.  ROLLTM SENT EACH 1 SEC.

 6375   REP  1          E6,1713      PAXERR1   EQUALS TUSED   +1    1P  INTEGRATED ROLL ERROR/360.
 6376   REP  1          E6,1714      ROLLTM    EQUALS PAXERR1 +1    1P  ROLL/180 FOR TM.
 6377   REP  1          E6,1715      ROLLC     EQUALS ROLLTM  +1    2P  ROLLCOM/360 FROM ENTRY (FOR TM)
A63771                                                                  ßß KEEP ROLLC d ROLLHOLD ADJACENT FOR TP
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 6378  REF  1          E6,1717        ROLLHOLD EQUALS ROLLC   +2    1P FOR ATTITUDE HOLD IN CMDAPMOD = +1
A63781

R63782          ENTRY DAP QUANTITIES THAT SHARE WITH RCS DAP.

 6379  REF  2 LAST 107  E6,1603        ALFACOM  EQUALS DCDU           1P  KEEP ADJACENT TO BETACOM.  ††
 6380  REF  1          E6,1604        BETACOM  EQUALS ALFACOM +1     1P

R6381   JET LIST'   DT, JETBITS  IN THIS ORDER.

 6382  REF  1          E6,1605        TOFF     EQUALS BETACOM +1     1P  DP PAIR
 6383  REF  1          E6,1606        TBITS    EQUALS TOFF +1        1P
 6384  REF  1          E6,1607        TON2     EQUALS TBITS +1       1P  DP PAIR
 6385  REF  1          E6,1610        T2BITS   EQUALS TON2 +1        1P

R6386   MISCELLANEOUS PERMANENT ERASEABLE.

 6386  REF  1          E6,1611        CUTTAG   EQUALS T2BITS  +1     1P
 6389  REF  1          E6,1612        NUJET    EQUALS CUTTAG +1      1P
R63891     MORE  ENTRY DAP QUANTITIES THAT  DO NOT SHARE WITH RCS DAP.

 63892 REF  1          E6,1720        JETEM    EQUALS ROLLHOLD +1    2P  THIS DP USED IN RATEAVG.
 6390  REF  1          E6,1722        GAMA     EQUALS JETEM   +2     1P
 6391  REF  1          E6,1723        GAMDOT   EQUALS GAMA    +1     1P
 6392  REF  1          E6,1724        POSEXIT  EQUALS GAMDOT  +1     1P
 6393  REF  1          E6,1725        CM/GYMDT EQUALS POSEXIT +1     1P
 6394  REF  1          E6,1726        HEADSUP  EQUALS CM/GYMDT +1    1P  DSP NOUN 61 FOR P62,63,64,67.
 63941 REF  1          E6,1727        P63FLAG  EQUALS HEADSUP +1     1P  INTERLOCK FOR WAKEP62
A63945

A63946                                                  ßß SHARE BELOW WITH RCS RUPT TEMPS (± 15D) ±±±
 6395  REF  2 LAST 106  E6,1506        CALFA    EQUALS SPNDX          1P
 6396  REF  1          E6,1507        SALFA    EQUALS CALFA +1       1P

 6397  REF  1          E6,1510        SINM     EQUALS SALFA +1       1P
 6398  REF  1          E6,1511        COSM     EQUALS SINM +1        1P
 6399  REF  1          E6,1512        SINO     EQUALS COSM +1        1P
 6400  REF  1          E6,1513        COSO     EQUALS SINO +1        1P
 6401  REF  1          E6,1514        SINOCOSM EQUALS COSO +1        1P
 6402  REF  1          E6,1515        COSOCOSM EQUALS SINOCOSM +1    1P
A64021                                                  ßß SHARE ABOVE WITH RCS RUPT TEMPS          ±±±
A6403
R6404           THE FOLLOWING FEW REGISTERS USED ONCE EACH 2 SEC.

 6405  REF  1          E6,1613        -VT/180  EQUALS NUJET   +1    1P
 6406  REF  1          E6,1614        LCX/360  EQUALS -VT/180 +1    1P
 6407  REF  1          E6,1615        XD/360   EQUALS LCX/360 +1    1P
 6408  REF  1          E6,1616        VSQ/4API EQUALS XD/360 +1     1P
 6409  REF  1          E6,1617        JNDX     EQUALS VSQ/4API +1   1P
 6410  REF  1          E6,1620        JNDX1    EQUALS JNDX +1       1P
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 6411   REF  1              E6,1621          TON1     EQUALS JNDX1 +1        1P  DP PAIR
 6412   REF  1              E6,1622          T1BITS   EQUALS TON1     +1     1P

R64121          MISCELLANEOUS REGISTERS USED EACH UPDATE.

 6413   REF  1              E6,1623          CM/SAVE  EQUALS T1BITS   +1     1P
 64131  REF  1              E6,1624          JETEM2   EQUALS CM/SAVE +1     1P  TEMPORARY STORAGE
A6414
R6416           DAP   QUANTITIES SHARED WITH RCS DAP FOR TM d FLIGHT RECORDER.

 6419   REF  2  LAST  107   E6,1567          VDT/180  =       ERRORX         1P  (EDIT)
 6420   REF  2  LAST  107   E6,1570          -VT/180E =       ERRORY         1P  (EDIT)

 6421   REF  1              E6,1476          PAXERR   EQUALS AK              1P  ROLL ERROR FOR NEEDLES
 6422   REF  2  LAST  107   E6,1572          QAXERR   =       THETADX        1P  SINCE AK1 IS ZEROED IN ATM DAP.
 6423   REF  1              E6,1573          RAXERR   =       QAXERR   +1    1P  SINCE AK2 IS ZEROED IN TM DAP.
A6424
R6425           **** COLMANU (R60,R62) ****

 6426   REF  1              E6,1710          VECQTEMP EQUALS COPSKEW
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P6427  ******** KALCMANU VARIABLES. (71D) ********************************
 6428  REF  1              E6,1661   BCDU     EQUALS YMANNDX  +1    B(3) TMP
 6429  REF  2  LAST 109    E6,1664   KSPNDX   EQUALS BCDU +3        B(1)TMP
 6430  REF  1              E6,1665   KDPNDX   EQUALS KSPNDX  +1    B(1)TMP

 6431  REF  1              E6,1666   TMIS     EQUALS KDPNDX  +1    I(16) MUST BE IN SAME BANK AS RCS DAP
 6432  REF  1              E6,1710   COFSKEW  EQUALS TMIS    +18D  I(6)  MUST BE IN SAME BANK AS RCS DAP
 6433  REF  2  LAST 111    E6,1716   CAM      EQUALS COFSKEW +6    I(2)  MUST BE IN SAME BANK AS RCS DAP

 6434  REF  1              E6,1720   MIS      EQUALS CAM     +2    I(18)  (THE REST MAY GO ANYWHERE)
 6435  REF  1              E6,1742   COF      EQUALS MIS     +18D  I(6)TMP
 6436  REF  1              E6,1750   SCAXIS   EQUALS COF     +6    I(6)TMP
 6437  REF  1              E6,1756   POINTVSM EQUALS SCAXIS  +6    I(6)TMP
 6438  REF  1              E6,1764   AM       EQUALS POINTVSM +6   I(2)TMP
 6439  REF  1              E6,1766   RAD      EQUALS AM      +2    I(2)TMP
R6440  FIRST-ORDER OVERLAYS IN KALCMANU

 6441  REF  2  LAST 112    E6,1666   KV1      EQUALS TMIS          I(6)TMP
 6442  REF  3  LAST 112    E6,1666   MPISYM   EQUALS TMIS          I   TMP
 6443  REF  4  LAST 112    E6,1666   TMPI     EQUALS TMIS          I   TMP
 6444  REF  5  LAST 112    E6,1666   NCDU     EQUALS TMIS          B   TMP
 6445  REF  6  LAST 112    E6,1671   NEXTIME  EQUALS TMIS    +3    B   TMP
 6446  REF  7  LAST 112    E6,1672   TTEMP    EQUALS TMIS    +4    B   TMP
 6447  REF  8  LAST 112    E6,1674   KV2      EQUALS TMIS    +6    I(6)TMP
 6448  REF  9  LAST 112    E6,1674   BIASTEMP EQUALS TMIS    +8    B   TMP
 6449  REF 10  LAST 112    E6,1702   KV3      EQUALS TMIS    +12D  I(6)TMP
 6450  REF 11  LAST 112    E6,1702   OGF      EQUALS TMIS    +12D  I   TMP

 6451  REF  3  LAST 112    E6,1710   BRATE    EQUALS COFSKEW       B   TMP
 6453  REF  2  LAST 112    E6,1716   TM       EQUALS CAM           B   TMP

R6454  SECOND-ORDER OVERLAYS IN KALCMANU

 6455  REF  1              E6,1666   P21      EQUALS KV1           I(2)TMP
 6456  REF  2  LAST 112    E6,1670   D21      EQUALS KV1     +2    I(2)TMP
 6457  REF  3  LAST 112    E6,1672   G21      EQUALS KV1     +4    I(2)TMP
A6458
R6464           SATURN BOOST STORAGE. SAVE TILL RCS DAP OPERATION.  (17D)

 6466  REF  3  LAST 112    E6,1661   POLYNUM  EQUALS BCDU          B(15) PAD LOADED
 6467  REF  1              E6,1673   POLYLOC  =      POLYNUM +10D
 6466  REF  2  LAST 112    E6,1700   SATRLRT  EQUALS POLYNUM +15D  B(2)  PAD LOADED
A6469
R6470           MORE P11 STORAGE -PAD LOADED-                       (2D)
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R6472           (NOTE' THIS PAD LOAD WILL NOT BE PRESERVED THROUGHOUT THE MISSION AS IT SHARES STORAGE WITH KALCMANU,
R6474            ENTRY DAP AND TVC DAP)

 6475   REF  1          E6,1702          RPSTART  EQUALS SATHLRT  +2     B(1) PITCH ROLL START TIME
 6476   REF  1          E6,1703          POLYSTOP EQUALS RPSTART  +1     B(1) POLYCUT OFF MINUS RPSTART SEC
A6477
R6478           STORAGE FOR VHHDOT AND ATTDSP

 6479   REF  1          E8,1704          BODY3    EQUALS POLYSTOP +1     B(1)OUT
 6480   REF  1          E6,1705          BODY2    EQUALS BODY3    +1     B(1)OUT
 6481   REF  1          E8,1708          BODY1    EQUALS BODY2    +1     B(1)OUT
 6482   REF  1          E6,1707          SPOLYARG EQUALS BODY1    +1     B(1)TMP  ARGUEMENT FOR POLLY

 6483   REF  1          E8,1503          OLDBODY1 =      EDRIVEX                1 PULSE = 0.0432 DEGREES
 6484   REF  1          E8,1504          OLDBODY2 =      EDRIVEY
 6485   REF  1          E8,1505          OLDBODY3 =      EDRIVEZ
R6486           STORAGE FOR S11.1

 6487   REF  1          E6,1710          VDISP    EQUALS SPOLYARG +1     I(2)OUT   2(7)  M/CS
 6488   REF  1          E6,1712          HDISP    EQUALS VDISP    +2     I(2)OUT   2(29) M
 6489   REF  1          E6,1714          HDOTDISP EQUALS HDISP +2        I(2) OUT    2(7) M/CS
 6490   REF  1          E6,1716          BOOSTEMP EQUALS HDOTDISP +2     B(2) TEMP

R6491           P21 STORAGE.                                            (1D)

 6493   REF  1          E8,1770          GENRET   EQUALS RAD      +2     B(1)TMP
R6494           R61CSM STORAGE.                                         (1D)

 6496   REF  1          E6,1771          SAVEBNK  EQUALS GENRET   +1     B(1) S-S SAVE EBANK FOR R61 SUBROUTINE
R6497           CRS61.1 STORAGE FOR AUTOPILOT BANK.                     (3D)

 6499   REF  1          E6,1772          SAVEDCDU EQUALS SAVEBNK  +1     B(3) TMP
A6500
R6501           R61 STORAGE.                                            (1D)

 6503   REF  1          E6,1775          R61CNTR  EQUALS SAVEDCDU +3      (1)TMP
R6504           ENTRY RESTART PROTECTION STORAGE. -KEEP TEMPS IN ORDER-  (12D)
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 6506  REF  2  LAST  113   E6,1770          TEMPROLL EQUALS GENRET          B(1)TMP COPY CYCLE REGISTER
 6507  REF  1               E6,1771          TEMPALPA EQUALS TEMPROLL +1     B(1)TMP COPY CYCLE REGISTER
 6508  REF  1               E6,1772          TEMPBETA EQUALS TEMPALPA +1     B(1)TMP COPY CYCLE REGISTER
 6509  REF  1               E6,1773          60GENRET EQUALS TEMPBETA +1     B(1)TMP QSAVE FOR S61.1 AND ENTRY.
 6510  REF  1               E6,1774          S61DT    EQUALS 60GENRET +1     B(1)TMP VARIABLE DT FOR S61.1 RESTART.
A6511
R6512          ENTRY TM SHARING FOR ACCELERATION PROFILE.

 6513  REF  2  LAST  106   E6,1533          XPIPBUF  EQUALS ADOT            B(1) P1PA BUFFER FOR TM DURING ENTRY.
 6514  REF  1               E6,1534          YPIPBUF  EQUALS XPIPBUF  +1     B(1) P1PS FILED HERE EACH .5 SEC APPEAR
 6515  REF  1               E6,1535          ZPIPBUF  EQUALS YPIPBUF  +1     B(1) ON DOWNLIST ONCE PER SECOND DURING
 6516  REF  1               E6,1538          XOLDBUF  EQUALS ZPIPBUF  +1     B(1) ENTRY AFTER RCS DAP HAS BEEN DIS-
 6517  REF  1               E6,1537          YOLDBUF  EQUALS XOLDBUF  +1     B(1) ABLED. NEWEST PIP VALUE REPLACES
 6518  REF  1               E6,1540          ZOLDBUF  EQUALS YOLDBUF  +1     B(1) PIPBUF,WHICH IS MOVED INTO OLDBUF.
R6519

R6520          REENTRY VARIABLES SHARED WITH RCS DAP FOR TM & FLIGHT RECORDER.

 6521  REF  2  LAST  107   E6,1574          Q7       =       THETADZ        I(2)  HI-WORD ONLY ON DNLIST.

 6522  REF  3  LAST  108   E6,1525          ASPS(TM) =       WBODY          I(6) DWN
A8523                                                                            ASKEP,ASP1,ASPUP,ASPDN,ASP3,ASP3+1
A6524

 6525  REF  1               E6,1776          END-E6   EQUALS R61CNTR +1      NEXT FREE  E6 ADDRESS
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P7000                    EBANK=7 ASSIGNMENTS

 7001                        E7,1400                    SETLOC 3400
R7002          *-*-*-*-  OVERLAY 0 IN EBANK 7 -*-*-*-*

R7003          EXTERNAL DELTA-V UPDATE.                                  (21D)

R7005          (MUST BE IN ORDER FOR UPDATE PROGRAM. ALSO ENTRY PROGRAMS PICK UP «LAT(SPL)« WITH A VLOAD.)

 7007                        E7,1400  E7,1424  LAT(SPL) ERASE          +20D  I(2)      DSP NOUN 61 FOR P62,63,64,67
 7006   REF  1               E7,1402           LNG(SPL) EQUALS LAT(SPL) +2   I(2)DSP NOUN 61 FOR P62,63,64,67.

 7009   REF  1               E7,1404           DELVSLV  EQUALS LNG(SPL) +2   I(6)TMP DELTA VEL VECT, LOC VER COORDS
 7010   REF  1               E7,1412           TIG      EQUALS DELVSLV  +6   B(2)DSP NOUN 33 FOR X-V64(R32),P30,40.
 7011   REF  1               E7,1414           RTARG    EQUALS TIG      +2   I(6)IN  DESIRED VEHICHE RADIUS VECTOR
 7012   REF  1               E7,1422           DELLT4   EQUALS RTARG    +6   I(2)IN  TIME DIFFERENCE FOR INITVEL
 7013   REF  1               E7,1424           ECSTEER  EQUALS DELLT4   +2   I(1)PL   FOR P40 S
 70135  REF  2  LAST  115    E7,1404           DELVLVC  =      DELVSLV
 70136                       E7,1425  E7,1425  END-DELV ERASE                *NEXT AVAIL LOC AFTER UNSHARED E7*
R7015          SERVICER STORAGE.                                         (13D)

 7020   REF  1               E7,1425           DVTOTAL  EQUALS END-DELV       B(2) DSP NOUN 40,99 FOR P30,34,35,40
 7021   REF  1               E7,1427           TGO      EQUALS DVTOTAL  +2   B(2)
 7023   REF  1               E7,1431           DVCNTR   EQUALS TGO      +2   B(1)TMP
 7024   REF  5  LAST   32    E7,1432           DELVREF  EQUALS DVCNTR   +1   I(6)TMP

 70241  REF  1               E7,1447           NOMTIG   EQUALS END-KALC       I(2) (CAN NOT SHARE WITH KALCMANU
A702411                                                                      OR DELVREF)
 7025   REF  1               E7,1451           END-SVCR EQUALS NOMTIG   +2   ***NEXT AVAILABLE AFTER SERVICER
A70255
R7026          ALIGNMENT STORAGE.                                        (25D)

 7026   REF  1               E7,1451           XSCD     EQUALS END-SVCR       I(6)TMP
 7029   REF  1               E7,1457           YSCD     EQUALS XSCD     +6   I(6)TMP
 7030   REF  1               E7,1465           ZSCD     EQUALS YSCD     +6   I(6)TMP
 7033   REF  1               E7,1473           VEL/C    EQUALS ZSCD     +6   I(6)TMP
 7034   REF  1               E7,1501           R53EXIT  EQUALS VEL/C    +6   I(1)TMP
R70342         ALIGNMENT MARKDATA (DOWNLNK)******                        (7D)
 70344  REF  1               E7,1502           MARK2DWN EQUALS R53EXIT  +1   (7)  USED BY ALLIGNMENT P50S
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P7035 *-*-*-* OVERLAY 1 IN EBANK 7 -*-*-*-*

R7036 REENTRY ERASABLES (208D)

7039	REP	2	LAST 115	E7,1451	RTINIT	EQUALS	END-SVCR	6P
7040	REP	1		E7,1457	RTEAST	EQUALS	RTINIT +6	6P
7041	REP	1		E7,1465	RTNORM	EQUALS	RTEAST +6	6P
7042	REP	1		E7,1473	RT	EQUALS	RTNORM +6	6P
7043	REP	1		E7,1501	UNI	EQUALS	RT +6	6P
7044	REP	1		E7,1507	UNITV	EQUALS	UNI +6	6P
7045	REP	1		E7,1515	VEL	EQUALS	UNITV +6	6P
7046	REP	1		E7,1523	TIME/RTO	EQUALS	VEL +6	2P TIME OF INITIAL TARGET, RTO.
7047	REP	1		E7,1525	-VREL	EQUALS	TIME/RTO +2	8P
7048	REP	1		E7,1533	OLDUYA	EQUALS	-VREL +6	6P USED BY CM/POSE (ENTRY DAP)
7049	REP	1		E7,1541	UXA/2	EQUALS	OLDUYA +6	6P USED BY CM/POSE (ENTRY DAP) -UVA
70495	REP	1		E7,1541	URH	=	UXA/2	P61 DISPLAY NOUN
7050	REP	2	LAST 116	E7,1547	UYA/2	EQUALS	UXA/2 +6	8P USED BY CM/POSE (ENTRY DAP) UYA
7051	REP	1		E7,1555	UZA/2	EQUALS	UYA/2 +6	6P USED BY CM/POSE (ENTRY DAP) UNA
7052	REP	1		E7,1563	UBX/2	EQUALS	UZA/2 +6	6P USED BY CM/POSE (ENTRY DAP)
7053	REP	1		E7,1571	UBY/2	EQUALS	UBX/2 +6	6P USED BY CM/POSE (ENTRY DAP)
7054	REP	1		E7,1577	UBZ/2	EQUALS	UBY/2 +6	6P USED BY CM/POSE (ENTRY DAP)
7055	REP	1		E7,1605	DTEAROT	EQUALS	UBZ/2 +6	2P
7056	REP	1		E7,1607	DIFF	EQUALS	DTEAROT +2	2P
7057	REP	1		E7,1611	DIFFOLD	EQUALS	DIFF +2	2P
7058	REP	1		E7,1613	FACTOR	EQUALS	DIFFOLD +2	2P
7059	REP	1		E7,1615	FACT1	EQUALS	FACTOR +2	2P
7060	REP	1		E7,1617	FACT2	EQUALS	FACT1 +2	2P
A7061					Q7	=	THETADZ	2P SHARED FOR TM. P84-P86
7062	REP	1		E7,1621	VSQUARE	EQUALS	FACT2 +2	2P
7065	REP	1		E7,1623	LAD	EQUALS	VSQUARE +2	2P
7066	REP	1		E7,1625	LOD	EQUALS	LAD +2	2P
7067	REP	1		E7,1627	L/DCMINR	EQUALS	LOD +2	2P
7068	REP	1		E7,1631	KLAT	EQUALS	L/DCMINR +2	2P
7069	REP	1		E7,1633	L/D	EQUALS	KLAT +2	2P
7070	REP	1		E7,1635	L/D1	EQUALS	L/D +2	2P
7071	REP	1		E7,1724	LEWD	=	VIO	2P SHARED FOR TM. P64-P65
7072	REP	1		E7,1637	D	EQUALS	L/D1 +2	2P DSP NOUN 64,66,66 FOR P63,64,67
A7073					V1	=	ENDRUF +1	2P SHARED FOR TM. P64-P65
7074	REP	1		E7,1641	DLEWD	EQUALS	D +2	2P
7076	REP	1		E7,1643	K2ROLL	EQUALS	DLEWD +2	2 P
7077	REP	1		E7,1645	GOTOADDR	EQUALS	K2ROLL +2	1P
7078	REP	1		E7,1646	TEM1B	EQUALS	GOTOADDR +1	2 P
7079	REP	1		E7,1850	MM	EQUALS	TEM1B +2	2 P
7080	REP	1		E7,1851	GRAD	EQUALS	MM +1	1P
7081	REP	1		E7,1652	PX	EQUALS	GRAD +1	1P OVERWRITES NEXT 5 LOCS IN P67.
7082	REP	1		E7,1653	LEQ	EQUALS	PX +1	2P
7083	REP	1		E7,1655	DHOOK	EQUALS	LEQ +2	2P
7084	REP	1		E7,1657	AHOOKDV	EQUALS	DHOOK +2	2P

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 7065   REF  1                E7,1661          DVL      EQUALS AHOQCDV +2     2P
A7066                                          A0       =      ENDBUP +3      2P    SHARED FOR TM.(HI-WD ) P64-P65
 7069   REF  1                E7,1663          A1       EQUALS DVL     +2     2P
 7090   REF  1                E7,1665          VBARS    EQUALS A1 +2          2P
 7091   REF  1                E7,1667          COSG/2   EQUALS VBARS +2       2P
A7092                                          GAMMAL   =      GAMMABI        2P    SHARED FOR TM  P64
 70921                          0026           GAMMAL1  =      22D            2P
 7093   REF  1                E7,1671          VS1      EQUALS COSG/2  +2     2P
 7094   REF  1                E7,1766          VL       =      VPRED          2P    SHARED FOR TM   P64-P65
 7095   REF  1                E7,1673          V        EQUALS VS1     +2     2P
A7096                                          VREP     =      THETAD  +2     2P    SHARED FOR TM    P65
 70961  REF  1                E7,1675          LATANG   EQUALS V       +2     2P    ADJACENT FOR TM.
 7097   REF  1                E7,1677          RDOT     EQUALS LATANG  +2     2P    ADJACENT FOR TM.
 70971  REF  1                E7,1701          THETAH   EQUALS RDOT    +2     2P    DSP NOUN 64,67 FOR P63,64,67
A7096                                          RDOTREF  =      THETAD         2P    SHARED FOR TM     P65
 7099   REF  1                E7,1703          ALP      EQUALS THETAH  +2     2P

 7100   REF  1                E7,1730          ASKEP    =      ASPS           2P)                 THESE ARE STORED IN
 7101   REF  2  LAST  117     E7,1731          ASP1     =      ASPS    +1     2P)                 SEQUENCE;OVERLAPPING
 7102   REF  3  LAST  117     E7,1732          ASPUP    =      ASPS    +2     2P)δHI-WD OF EACH±  HI-WORD ONLY APPEARS
 7103   REF  4  LAST  117     E7,1733          ASPDWN   =      ASPS    +3     2P)                 ON DOWNLIST, EXCEPT
 7104   REF  5  LAST  117     E7,1734          ASP3     =      ASPS    +4     2P)                 ASP3 IS COMPLETE.

 7105   REF  1                E7,1705          C/D0     EQUALS ALP     +2     2P    -1/D0
 7106   REF  1                E7,1707          D0       EQUALS C/D0    +2     I(2)    CONSTANT DRAG
 7107   REF  1                E7,1711          Q2       EQUALS D0      +2     2P
A7106
R7109                ROLLC IS LOCATED IN EBANK= ACG TO AID ENTRY DAP.
 7110   REF  1                E7,1713          RTGO     EQUALS Q2      +2     2P    DSP NOUN 66 FOR P64,P67.
 7111   REF  1                E7,1715          DNRNGERR EQUALS RTGO    +2     2P DSP NOUN 66 FOR P64,67.
 71111  REF  2  LAST  117     E7,1675          XRNGERR  =      LATANG         2P      FOR DISKY DISPLAY
 7112   REF  1                E7,1717          KAT      EQUALS DNRNGERR +2    2P
 7113   REF  1                E7,1721          GMAX     EQUALS KAT     +2     1P  DSP NOUN 60 FOR P61,62,63.
A7114                                                                         GMAX IS LOADED IN  DOUBLE PRECISION
 71141  REF  1                E7,1726          L/DCALC  =      TIE            2P  CALCULATED L/D FOR TM'  P64 - P67.
 71151  REF  1                E7,1770          GAMMAL   =      GAMMABI        2P  SHARED FOR TM   P64
 7116   REF  2  LAST  117     E7,1770          PREDANG  =      GAMMABI            FOR TM IN P67.
 7117   REF  1                E7,1771          JJ       =      PREDANG +1         FOR TM IN P67.
 7118   REF  1                E7,1722          VMAGI    EQUALS GMAX    +1     2P DSP NOUN 62,64,66 FOR P11,63,64.
 7119   REF  1                E7,1724          VIO      EQUALS VMAGI   +2     2P  DSP NOUN 63 FOR P61.
 7120   REF  2  LAST  116     E7,1726          TIE      EQUALS VIO     +2     2P  DSP NOUN 63 FOR P61.
 712005 REF  2  LAST  117     E7,1730          ASPS     EQUALS TIE      +2    I(2)     HI-WORD ONLY ON DNLIST FOR TEMP
 712006 REF  6  LAST  117     E7,1732          TIE1     EQUALS ASPS    +2     I(2ETMP HOLDS UNDECREMENTED TIE VALUE
R71201               **** P60S ****

 71202  REF  2  LAST  117     E7,1713          RTGON64  EQUALS RTGO           RANGE ERRORS NEGATIVE IF FALLS SHORT
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 71203  REF   3  LAST  117   E7,1713          RTGON67  EQUALS RTGO              DSP NOUN 67
A71204
R71205          REENTRY, RETURN TO EARTH COMMON DISPLAY.                        (4D)

 71207  REF   1               E7,1766          VPRED    EQUALS BETA12  +2       DSP NOUN 60 FOR P61,   ,62,63.
 71206  REF   2  LAST  117   E7,1770          GAMMAEI  EQUALS VPRED   +2       DSP NOUN 60 FOR P61,   ,62,63.
A71209
R7121           SOME P11 DISPLAY REGISTERS.                                     (6D)

 7123   REF   1               E7,1734          ALTI     EQUALS TIE1    +2       2P DSP NOUN 62 FOR P11.
 7124   REF   1               E7,1736          HDOT     EQUALS ALTI    +2       2P DSP NOUN 62 FOR P11.
A71241
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P7130           *-*-*-*-  OVERLAY 2 IN EBANK 7 -*-*-*-*

R7131           KALCMANU STORAGE.                                                (18D)

 7133   REF  2  LAST  115  E7,1425          MFS       EQUALS END-DELV          I(18)
 7134   REF  1              E7,1425          MFI       EQUALS MFS               I   TMP
 7136   REF  2  LAST  119  E7,1425          DEL       EQUALS MFS               I   TMP
 7138   REF  3  LAST  119  E7,1447          END-KALC  EQUALS MFS      +18D     **NEXT AVAIL LOC AFTER KALCMANU **
R7139           MEASUREMENT INCORPORATION STORAGE(R22) STORAGE.                  (56D)

 7141   REF  2  LAST  115  E7,1447          TX789     EQUALS END-KALC          I(6)TMP
 7142   REF  1              E7,1455          GAMMA     EQUALS TX789     +6      I(2)TMP
 7143   REF  1              E7,1457          OMEGA     EQUALS GAMMA     +2      I(18)TMP
 7144   REF  1              E7,1501          BVECTOR   EQUALS OMEGA     +18D    I(18)TMP
 7145   REF  1              E7,1523          DELTAQ    EQUALS BVECTOR   +18D    I(2)TMP
 7146   REF  1              E7,1525          VARIANCE  EQUALS DELTAQ    +2      I(3)TMP
 7147   REF  1              E7,1530          RCLP      EQUALS VARIANCE  +3      I(6)TMP
 7148   REF  1              E7,1536          GRP2SVQ   EQUALS RCLP      +6      I(1)TMP QSAVE FOR RESTARTS
R7149           P20, P22, P23 DSP NOUN                                           (5D)

 7151   REF  2  LAST  119  E7,1501          N49DISP   EQUALS BVECTOR           B(5)TMP
R7154           S22.1 STORAGE.                                                   (36D)

 7156   REF  1              E7,1537          SVMRKDAT  EQUALS GRP2SVQ   +1      I(36)TMP 5 SETS OF MARK DATA +PAD OF ONE
R7162           **** CISLUNAR NAV. ERAS. (P20S) ****                             (57D).

 7164   REF  1              E7,1603          TRUNX     EQUALS SVMRKDAT  +36D
 71641  REF  1              E7,1603          DATATEST  EQUALS TRUNX              (1)
 7165   REF  2  LAST  119  E7,1604          UBAR0     EQUALS TRUNX     +1
 7166   REF  1              E7,1612          UBAR1     EQUALS UBAR0     +6
 7167   REF  1              E7,1620          UBAR2     EQUALS UBAR1     +6
 7168   REF  1              E7,1626          RZC       EQUALS UBAR2     +6
 7169   REF  1              E7,1634          VZC       EQUALS RZC       +6
 7170   REF  1              E7,1642          UCLSTAR   EQUALS VZC       +6
 7171   REF  1              E7,1650          USSTAR    EQUALS UCLSTAR   +6
 7172   REF  1              E7,1656          RCLL      EQUALS USSTAR    +6
 7174   REF  1              E7,1664          RL        EQUALS RCLL      +6
 7176   REF  1              E7,1672          SRRETURN  EQUALS RL        +6
A7177
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P7192           *-*-*-*-  OVERLAY 3 IN EBANK 7 -*-*-*-*

R7193           RENDEZVOUS GUIDANCE STORAGE.  - P32...P35 -                (8D)

 7195  REF  3   LAST 119   E7,1447   DELTEEO  EQUALS END-KALC              I(2) S-S BACK VALUES OF DELTA TIME
 7196  REF  1              E7,1451   DELEL    EQUALS DELTEEO  +2           I(2) S-S
 7197  REF  1              E7,1453   SECMAX   EQUALS DELEL    +2           I(2) S-S MAX STOP SIZE FOR ROUTINE
 7198  REF  1              E7,1455   XXXALT   EQUALS SECMAX   +2           I(2)
A7199
R7200           S40.9 STORAGE.                                             (16D)

 7202  REF  1              E7,1457   VG       EQUALS XXXALT   +2           I(6)TMP
 7203  REF  1              E7,1485   VRPREV   EQUALS VG       +6           I(6)
 7204  REF  1              E7,1473   TNIT     EQUALS VRPREV   +6           I(2)
 7205  REF  1              E7,1475   TNITPREV EQUALS TNIT     +2           I(2)
R7208           S40.2,3 STORAGE.                                           (1D)

 7208  REF  1              E7,1477   AXISCODE EQUALS TNITPREV +2           I(1)IN
R72085          P30«S-P17 COMMON STORAGE.                                  (24D)

 7210  REF  2   LAST 119   E7,1537   RACT3    EQUALS GRP2SVQ  +1           I(8)TMP POSITION OF ACTIVE AT TPI TIME.
 7211  REF  1              E7,1545   VACT3    EQUALS RACT3    +6           I(8)TMP VELOCITY OF ACTIVE AT  TPI TIME.
 7212  REF  1              E7,1553   RPASS3   EQUALS VACT3    +6           I(8)TMP POSITION OF PASSIVE AT TPI TIME.
 7213  REF  1              E7,1581   VPASS3   EQUALS RPASS3   +6           I(8)TMP VELOCITY OF PASSIVE AT TPI TIME.
R72131          P76, N84 DISPLAY                                           (6D)

 72133 REF  2   LAST 120   E7,1537   DELVOV   EQUALS RACT3                 I(8)DSP NOUN 84 FOR X-V84, P34-35
A72134

R7214           INITVEL/MIDGIM STORAGE.                                    (34D)
R7216                 (CALLED BY S34.1,2,  S35.1,2, AND S40.9)
R7217                 (CALLS LAMBERT, CONIC SUBROUTINES)

 7218  REF  1              E7,1567   RINIT    EQUALS VPASS3   +6           I(8)IN  ACTIVE VEHICLE RADIUS VECTOR
 7219  REF  1              E7,1575   VINIT    EQUALS RINIT    +6           I(8)IN  ACTIVE VEHICLE VELOCITY VECTOR
 7220  REF  1              E7,1603   RTARG1   EQUALS VINIT    +6           I(8)TMP SHIFTED RTARG
 7221  REF  1              E7,1811   VIPRIME  EQUALS RTARG1   +6           I(6)OUT   NEW VEL REQ AT INITIAL RADIUS
 7222  REF  1              E7,1617   VTPRIME  EQUALS VIPRIME  +6           I(6)OUT TOTAL VELOCITY AT DESIRED RADIUS
 7223  REF  1              E7,1625   +MGA     EQUALS VTPRIME  +6           I(2)DSP NOUN 45 FOR P30,34,35. +MID GIM.
 7224  REF  1              E7,1627   COSY4    EQUALS +MGA     +2           I(2)TMP COSINE OF ANGLE WHEN ROT STARTS

R7225           (THE FOLLOWING OVERLAYS MEASUREMENT INCORP AND CAN NOT SHARE WITH TPI
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 T227   REF  1              E7,1502          INTIME  EQUALS AXISCODE +3
 T226   REF  1              E7,1504          ITCTR   EQUALS INTIME   +2    1(1) TMP ITERATION COUNTER
 T229   REF  1              E7,1631          END-IN/M EQUALS COZY4   +2    **NEXT AVAIL LOC AFTER IN1TVEL/MIDG1M**
R7230          P34 AND P33 STORAGE.  (OVERLAYS INITVEL/MIDG1M)            (24D)

 T232   REF  2 LAST 120   E7,1567          VAPREC  EQUALS R1N1T            I(6) S-S PREC VEC FOR NOM TPI TIME(ACT V
 T233   REF  2 LAST 120   E7,1575          RAPREC  EQUALS V1N1T            I(6) S-S PREC VEC FOR NOM TPI TIME(ACT V
 T234   REF  2 LAST 120   E7,1611          VPPREC  EQUALS VIPRIME          I(6) S-S PREC VEC FOR NOM TPI TIME(PASS
 T235   REF  2 LAST 120   E7,1617          RPPREC  EQUALS VTPRIME          I(6) S-S PREC VEC FOR NOM TPI TIME(PASS
R7236
R7237          P30, P40 INTERFACE.                                        (20D)

 T239   REF  1              E7,1631          RTIG    EQUALS END-IN/M         I(6)TMP
 T240   REF  1              E7,1637          VTIG    EQUALS RTIG     +6      1(6)TMP
 T241   REF  1              E7,1645          DELVSIN EQUALS VTIG     +6      I(6)TMP
 T2414  REF  1              E7,1645          DELVEET3 EQUALS DELVSIN             TMP DELTA VEL VECT INERTIAL COORDS.
 T2416  REF  1              E7,1645          VGTEMP  EQUALS DELVEET3
 T242   REF  2 LAST 121     E7,1653          DELVSAB EQUALS DELVSIN  +6      1(2)TMP
 T243   REF  1              E7,1653          VGD1SP  =      DELVSAB              DSP NOUN 40,42,99FOR P30,34,35,40,41
R7244          P35-P40 INTERFACE STORAGE. (OVERLAYS P30-P40 I/F STORAGE)  (12D)

 T246   REF  2 LAST 121     E7,1631          RPASS4  EQUALS RTIG             I(6)TMP POSITION OF PASSIVE AT INTERCEPT
 T247   REF  1              E7,1637          VPASS4  EQUALS RPASS4   +6      I(6)TMP VELOCITY OF PASSIVE AT INTERCEPT
R72472         TPI SEARCH (P17)                                           (6D)

 T2476  REF  1              E7,1645          E2      EQUALS VPASS4   +6      I(6)TMP
A72476
R7248          P30-P40 COMMON STORAGE.                                    (3D)

 T250   REF  2 LAST 121     E7,1655          TPASS4  EQUALS DELVSAB  +2      I(2)TMP
 T251   REF  1              E7,1655          TINT    =      TPASS4           I(2)
 T254   REF  2 LAST 121     E7,1657          QTEMP   EQUALS TPASS4   +2      I(1) TMP
A72545
R7255          P30-P40 STORAGE.                                           (4D)

 T257   REF  1              E7,1660          TTOGO   EQUALS QTEMP    +1      B(2)DSP NOUN 35,40,45,59,99
A7256                                                                              FOR P30,34,35,40,41,47,  R30.
 T259   REF  1              E7,1662          TTP1    EQUALS TTOGO    +2      B(2)DSP NOUN 37 FOR P34 TPI TIME, CSECS.
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 7260   REF  1                 E7,1664          END-P30S EQUALS TTPI      +2    **NEXT AVAIL LOC AFTER P30-40 STORAGE.**
R7261          P40 STORAGE.                                                      (8D)

 7263   REF  1                 E7,1664          VGBODY   EQUALS END-P30S         B(6)DSP NOUN 65 FOR P40,41,42 VG-SC COOR
 7264   REF  1                 E7,1664          DELVCTL  =      VGBODY
 7265   REF  2  LAST  122      E7,1672          P40TMP   EQUALS VGBODY    +6     B(2)TMP
R7266          P47 STORAGE.

 7267   REF  2  LAST  120      E7,1457          DV47TEMP EQUALS VG
 7268   REF  3  LAST   32      E7,1674          DELVIMU  EQUALS P40TMP    +2     I(6)  DSP  NOUN 63 FOR P47 DELTAV(IMU)
A7265
R7269          S40.1 STORAGE.                                                    (23D)

 7271   REF  1                 E7,1702          CSTEER   EQUALS DELVIMU   +6     I(2)IN
 7273   REF  1                 E7,1704          BDT      EQUALS CSTEER    +2     I(6)IN
 7274   REF  1                 E7,1712          UT       EQUALS BDT       +6     I(6)OUT THRUST DIRECTION
 7275   REF  1                 E7,1720          VGTIG    EQUALS UT        +6     I(6)OUT
 7276   REF  1                 E7,1720          VGPREV   =      VGTIG
 7277   REF  2  LAST  122      E7,1726          P        EQUALS VGTIG     +6     I(2)OUT S40.3 NEEDS THIS

 7278   REF  1                 E7,1730          QTEMP1   EQUALS P         +2     I(1)TMP HOLDS RETURN
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F7279           *-*-*-*-  OVERLAY 4 IN EBANK 7 -*-*-*-*

RT280           S35.1 STORAGE.                                          (2D)

 T282   REP  2  LAST  122  E7,1664          TSTRT    EQUALS END-P30S    I(2)IN  MIDCOURSE START TIME
RT283           S34.1 STORAGE.          (OVERLAYS S35.1 STORAGE)        (1D)

 T285   REP  1            E7,1664          TITER    EQUALS TSTRT       I(1)TMP ITERATION COUNTER
RT286           (P30-31 Q-SAVES)                                        (1)

 T288   REP  1            E7,1664          P30/31RT EQUALS TITER       B(1)  RETURN POINT
AT289
RT290           P20=S(COLOSSUS) STORAGE.                                (6D)

 T292   REP  2  LAST  123  E7,1666          S22WUNL  EQUALS TSTRT   +2   1      WUNL W8 UNKNOWN INIT VALUE
 T294   REP  1            E7,1667          S22TOFF  EQUALS S22WUNL  +1   2    T SUB OFF
 T295   REP  1            E7,1671          S22TPRIM EQUALS S22TOFF +2   2      SAVE TP
 T296   REP  1            E7,1673          S22EORM  EQUALS S22TPRIM +2   0 = EARTH -- NON-ZERO = MOON
AT297
RT298           DOWNLINK ERASABLES FOR P22,P20 MARK DATA.               (8D)

 T300   REP  1            E7,1674          MARKDOWN EQUALS S22EORM  +1   B(1)
 T301   REP  1            E7,1703          RM       EQUALS S22RTNEX     DOWNLINK OF VHF RANGE
AT302
RT303           S22.1                                                   (1D)

 T305   REP  3  LAST   32 E7,1703          S22RTNEX EQUALS MARKDOWN +7   B(1)
AT306
RT307           CRS61.1 STORAGE.          -A SUBSET OF P20-             (14D)

 T309   REP  1            E7,1704          Q611     EQUALS RM       +1  I(1) TMP QSAVE
 T310   REP  1            E7,1705          Q6111    EQUALS Q611     +1  I(1)TMP QSAVE
 T311   REP  1            E7,1706          SAVEPOS  EQUALS Q6111    +1  I(6)TMP LEM POSITION VECTOR-
 T312   REP  1            E7,1714          SAVEVEL  EQUALS SAVEPOS  +6  I(6)TMP LEM VELOCITY VECTOR-
RT313           ATTITUDE MANEUVER -CALLED BY P20,R61,R63,CRS61.1        (3D)
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 T315  REP  1              E7,1722          PRAXIS   EQUALS SAVEVEL  +8    B(3) S-S DISP RES FOR PREF AXIS N95
R7316          MARK ROUTINE (R21) STORAGE.          -IS SUBSET OF R22-     (14D)

 T318  REP  1              E7,1725          MRKBUF1  EQUALS PRAXIS   +3    B(7)TMP R21 MARK BUFFER
 T319  REP  3  LAST  32    E7,1734          MRKBUF2  EQUALS MRKBUF1  +7    B(7)TMP R21 MARK BUFFER
R7320          MORE CONICS STORAGE.                                        (4)
 T322              E7,1774                 COGA     EQUALS 3774           I(2) COTAN OF INITIAL FLIGHT PATH ANGLE
 T323  REP  1      E7,1774                 INDEP    EQUALS COGA           I(1) USED BY SUBROUTINE'ITERATOR'
 T324  REP  2  LAST 124    E7,1776          EPSILONL EQUALS COGA      +2    I(2) TMP
A7325

R7328          RENDEZVOUS GUIDANCE STORAGE.  - P32...P35 -                 (10D)

 T328  REP  1              E7,1743          ELEV     EQUALS MRKBUF2  +7    I(2)TMP
 T329  REP  1              E7,1745          RTX1     EQUALS ELEV     +2     (1)
 T330  REP  1              E7,1748          RTX2     EQUALS RTX1     +1     (1)
 T331  REP  1              E7,1747          RTMU     EQUALS RTX2     +1     (2)
 T332  REP  1              E7,1751          RTSR1/MU EQUALS RTMU     +2     (2)
 T333  REP  1              E7,1753          CENTANG  EQUALS RTSR1/MU +2    I(2) S-S CENTRAL ANGLE COVERED(TPI-TPF)
A7334
R7335          TPI SEARCH(S17.1,S17.2) P17 STORAGE.                        (10D)

 T337  REP  2  LAST 124    E7,1743          DELTEE   EQUALS MRKBUF2  +7    I(2)
 T338  REP  1              E7,1745          XRS      EQUALS DELTEE   +2    I(2)
 T339  REP  1              E7,1747          THETL    EQUALS XRS      +2    I(2)
 T340  REP  1              E7,1751          TF       EQUALS THETL    +2    I(2)
 T341  REP  1              E7,1753          DELHITE  EQUALS TF       +2     (2)
```

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P703392          *-*-*-*-  OVERLAY 5 IN EBANK 7 -*-*-*-*

R90005           P17,P34                                                    (2D)

 90007  REF  2  LAST  121   E7,1645          NN1      EQUALS DELVEET3       I(2) DSP NOUN 55,R1

R9001    ************ THE FOLLOWING ARE FOR FLIGHT 504 ONLY ********************

R9002            RETURN-TO-EARTH STORAGE.                                   (93D)

 9004   REF  2  LAST  121   E7,1631          RTEDVD   EQUALS END-IN/M       I(2)IN  DELTA VELOCITY DESIRED  M/CS B7
 9005   REF  1               E7,1633          RTEGAM2D EQUALS RTEDVD   +2    I(2)IN  REENTRY ANGLE DESIRED   REVS B0
 9006   REF  1               E7,1635          RCON     EQUALS RTEGAM2D +2    I(2)TMP CONIC R2 RADIUS           M B29
 9007   REF  1               E7,1637          R(T1)/   EQUALS RCON     +2    I(6)TMP POSITION VECTOR AT TIG M B29/B27
 9008   REF  1               E7,1645          R(T1)    EQUALS R(T1)/   +6    I(2)TMP MAGNITUDE OF R(T1)/    M B29/B27
 9009   REF  1               E7,1647          DT21PR   EQUALS R(T1)    +2    I(2) TMP PREVOUS DT21           CS B30
 9010   REF  1               E7,1651          MAMAX1   EQUALS DT21PR   +2    I(2) TMP MAJ AXIS LOW BOUND LMT   M B30
 9011   REF  1               E7,1653          MAMAX2   EQUALS MAMAX1   +2    I(2) TMP MAJ AXIS UP BOUND LMT    M B30
 9012   REF  1               E7,1655          R(T2)/   EQUALS MAMAX2   +2    I(6)TMP FINAL POSITION VECTOR  M B29/B27
 9013   REF  1               E7,1663          RD       EQUALS R(T2)/   +6    I(2)TMP FINAL R DESIRED        M B29/B27
 9014   REF  1               E7,1665          DRCON    EQUALS RD       +2    I(2)TMP RCON SLOPE ITERATOR    M B29/B27
 9015   REF  1               E7,1667          RPRE,    EQUALS DRCON    +2    I(2)TMP PREVISOUS RPRE         M B29/B27
 9016   REF  1               E7,1671          V(T1)/   EQUALS RPRE,    +2    I(6)TMP VEL VECTOR AT TIG     M/CS B7/B5
 9017   REF  1               E7,1677          V2(T1)/  EQUALS V(T1)/   +6    I(6)TMP POST IMP VEL AT TIG   M/CS B7/B5
 9018   REF  1               E7,1705          DV       EQUALS V2(T1)/  +6    I(2)TMP DELTA VELOCITY AT TIG M/CS B7/B5
 9019   REF  1               E7,1707          V(T2)/   EQUALS DV       +2    I(6)TMP FINAL VELOCITY VECTOR M/CS B7/B5
 9020   REF  1               E7,1715          T1       EQUALS V(T2)/   +6    I(2)TMP INITIAL VECTOR TIME      CS B26
 9022   REF  1               E7,1717          PCON     EQUALS T1       +2    I(2)TMP SEMI-LATUS RECTUM         M B29
 9023   REF  1               E7,1721          X(T1)    EQUALS PCON     +2    I(2)TMP COTANGENT GAMMA1            B5
 9024   REF  1               E7,1723          T12      EQUALS X(T1)    +2    I(2)TMP INIT TO FINL POSIT TIME  CS B26
 9025   REF  1               E7,1725          DELTAT   EQUALS T12      +2    I(2) TMP DELTA T IN SAFE PERILUNE CS B26
 9026   REF  1               E7,1727          NN1A     EQUALS DELTAT   +2    I(2) TMP ITERATION COUNTER 1
 9027   REF  1               E7,1731          NN2      EQUALS NN1A     +2    I(2) TMP ITERATION COUNTER 2
 9028   REF  1               E7,1733          RTENCKEX EQUALS NN2      +2    I(1)TMP RTENCK RETURN ADDRESS
 9029   REF  1               E7,1734          CONICX1  EQUALS RTENCKEX +1    I(1)TMP CONICS MU TABLE INDEX
 9030   REF  1               E7,1735          T2       EQUALS CONICX1  +1    I(2)TMP FINAL TIME               CS B26
 9031   REF  1               E7,1737          UR1/     EQUALS T2       +2    I(6)TMP UNIT R(T1)/                 B1
 9032   REF  1               E7,1745          UV1/     EQUALS UR1/     +6    I(6)TMP UNIT V(T1)/                 B1
 9033   REF  1               E7,1753          BETA1    EQUALS UV1/     +6    I(2)TMP 1+X(T2)**2                  B1
 9034   REF  1               E7,1755          P(T1)    EQUALS BETA1    +2    I(1)TMP PRIMARY BODY STATE TIME 1   B14
 9036   REF  1               E7,1756          CFPA     EQUALS P(T1)    +1    I(2) TMP COSINE FLIGHT PATH ANGLE   B1
 9037   REF  1               E7,1760          PHI2     EQUALS CFPA     +2    I(2) TMP PERI OR APO INDICATOR      B2
 9038   REF  1               E7,1762          SPRTEX   EQUALS PHI2     +2    I(1)TMP ROUTINE RETURN ADDRESS
 9039   REF  1               E7,1763          VNSTORE  EQUALS SPRTEX   +1    I(1)TMP VERBNOUN STORAGE
 9040   REF  1               E7,1764          BETA12   EQUALS VNSTORE  +1    I(2)TMP SIGN FOR TIMERAD
R9041                OVERLAYS WITHIN RETURN-TO-EARTH STORAGE.

 9042                          0030          RPRE     EQUALS 24D            I(2)TMP COMPUTED PREC RADIUS  M B29/B27
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 9043                                   0032          P/RPRE    EQUALS 26D
 9044                                   0034          R/APRS    EQUALS 28D
 9045   REF   2  LAST  125              E7,1723       X(T2)PRE  EQUALS T12
 9046   REF   2  LAST  125              E7,1725       X(T2)     EQUALS DELTAT
 9048   REF   2  LAST  125              E7,1745       UH/       EQUALS UV1/
 9049   REF   2  LAST  115              E7,1412       SPRTETIG  EQUALS TIG
 9050   REF   2  LAST   88              E4,1721       RETLOCN   EQUALS XR1HOLD +1
R9051
 9900                                   E7,1777
 9901   REF   1                         E7,1777       WHOCARES =       3777
*** END OF KILERASE.080 ***                           END-E7    EQUALS WHOCARES
```

```
I(2)TMP P/R                                  B4
I(2)TMP R/A                                  B6
I(2)TMP PREC COTAN GAMMA2                    B0
I(2)TMP COTAN GAMMA2                         B0
I(2)TMP UNIT HORIZONTAL VECTOR.              B1
I(2)IN  TIME OF IGNITION                  CS B28

A DUMMY FOR E-BANK INSENSITIVE 2CADRS.
****** LAST LOCATION IN E7
```

```
0001                        4000                SETLOC 4000

0002  REF  1                                     COUNT  02/RUPTS

0003                        4000  0 0004 0      INHINT              GO
0004  REF  1                 4001  3 4054 1      CAF    GOBB
0005  REF  1                 4002  56 006 1      XCH    BBANK
0006  REF  1                 4003  1 2520 0      TCF    GOPROG

0007  REF  1                 4004  52 011 0      DXCH   ARUPT        T6RUPT
0008                        4005  0 0006 1      EXTEND
0009  REF  1                 4006  3 1311 0      DCA    T6LOC
0010                        4007  52 006 0      DTCB

0011  REF  2  LAST  127      4010  52 011 0      DXCH   ARUPT        T5RUPT
0012  REF  1                 4011  4 0030 0      CS     TIME5
0013  REF  1                 4012  6 4731 0      AD     .5SEC
0014  REF  1                 4013  1 4065 1      TCF    T5RUPT

0015  REF  3  LAST  127      4014  52 011 0      DXCH   ARUPT        T3RUPT
0016  REF  1                 4015  3 4055 0      CAF    T3RPTBB
0017  REF  2  LAST  127      4016  56 006 1      XCH    BBANK
0018  REF  1                 4017  1 3416 0      TCF    T3RUPT

0019  REF  4  LAST  127      4020  52 011 0      DXCH   ARUPT        T4RUPT
0020  REF  1                 4021  3 4063 0      CAF    T4RPTBB
0021  REF  3  LAST  127      4022  56 006 1      XCH    BBANK
0022  REF  1                 4023  1 2000 1      TCF    T4RUPT

0023  REF  5  LAST  127      4024  52 011 0      DXCH   ARUPT        KEYRUPT1
0024  REF  1                 4025  3 4056 0      CAF    KEYRPTBB
0025  REF  4  LAST  127      4026  56 006 1      XCH    BBANK
0026  REF  1                 4027  1 3613 1      TCF    KEYRUPT1

0027  REF  6  LAST  127      4030  52 011 0      DXCH   ARUPT        KEYRUPT2
0028  REF  1                 4031  3 4057 1      CAF    MKRUPTBB
0029  REF  5  LAST  127      4032  56 006 1      XCH    BBANK
0030  REF  1                 4033  1 2103 0      TCF    MARKRUPT

0031  REF  7  LAST  127      4034  52 011 0      DXCH   ARUPT        UPRUPT
0032  REF  1                 4035  3 4056 0      CAF    UPRPTBB
0033  REF  6  LAST  127      4036  56 006 1      XCH    BBANK
0034  REF  1                 4037  1 3636 0      TCF    UPRUPT

0035  REF  8  LAST  127      4040  52 011 0      DXCH   ARUPT        DOWNRUPT
0036  REF  1                 4041  3 4060 0      CAF    DWNRPTBB
0037  REF  7  LAST  127      4042  56 006 1      XCH    BBANK
0038  REF  1                 4043  1 3342 0      TCF    DODOWNTM

0039  REF  9  LAST  127      4044  52 011 0      DXCH   ARUPT        RADAR RUPT
```

```
0040  REF  1                    4045  3 4061 1          CAF    RDRPTBB
0041  REF  6  LAST  127         4048  56 008 1          XCH    BBANK
0042  REF  1                    4047  1 2476 1          TCF    VHFREAD

0043  REF  10 LAST  127         4050  52 011 0          DXCH   ARUPT          HAND CONTROL RUPT
0044  REF  1                    4051  3 4082 1          CAF    HCRUPTBB
0045  REF  9  LAST  128         4052  56 008 1          XCH    BBANK
0048  REF  1                    4053  1 5225 0          TCF    RESUME +3      NOT USED
0047  REF  1                  E3,1400                    EBANK= LST1           RESTART USES E0, E3
0048  REF  2  LAST  127         4054   12083 1  GOBB     BBCON  GOPROG

0049  REF  2  LAST  128       E3,1400                    EBANK= LST1
0050  REF  2  LAST  127         4055   02083 0  T3RPTBB  BBCON  T3RUPT

0051  REF  1                     0073                    EBANK= KEYTEMP1
0052  REF  2  LAST  127         4058   16060 0  KEYRPTBB BBCON  KEYRUPT1

0053  REF  4  LAST  124       E7,1725                    EBANK= MRKRUP1
0054  REF  2  LAST  127         4057   18087 1  MKRUPTBB BBCON  MARKRUPT

0055  REF  2  LAST  127         4056            UPRPTBB  =      KEYRPTBB

0056  REF  1                     0340                    EBANK= DNTMBUFF
0057  REF  2  LAST  127         4060   12080 1  DWNRPTBB BBCON  DCDOWNTM

0058  REF  1                   E7,1803                    EBANK= DATATEST
0059  REF  2  LAST  126         4081   56067 0  RDRPTBB  BBCON  VHFREAD
0060  REF  1                     0025                    EBANK= TIME1
0081  REF  2  LAST  126         4082   04060 0  HCRUPTBB BBCON  RESUME        NOT USED
0062  REF  1                     1302                    EBANK= DSRUPTSW
0063  REF  2  LAST  127         4063   14062 0  T4RPTBB  BBCON  T4RUPT
0064  REF  2  LAST  126         0025                    EBANK= TIME1
0085  REF  2  LAST  127         4064   04060 0  T5RPTBB  BBCON  T5RUPT

0066                           4065  0 0008 1  T5RUPT    EXTEND
0067  REF  1                   4068  8 5226 1           BZMF   NOQBRSM
0068                           4067  0 0006 1           EXTEND
0069  REF  1                   4070  3 1313 1           DCA    T5LOC
0070                           4071  52 006 0           DTCB
```